THE RELATIVE DEMAND FOR MAJOR SAWNTIMBER, POST AND POLE PRODUCTS OF PINUS CARIBAEA IN FIJI:

A STUDY OF THE DOMESTIC MARKET BASED ON SALES FROM THE FIJI PINE COMMISSION'S TIMBERYARD AT DRASA

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ABSTRACT

This is a study of relative demand for the ten top selling products, of sawntimber and of posts and poles, (principally *Pinus caribaea*) supplied from the Fiji Pine Commission's timberyard at Drasa to local markets. It is made by analysis of sales data and a stocktake made at the end of the period examined. Only physical quantities without monetary values or price effects are considered and demand is discovered, only in so far as it is revealed by what is available for sale.

Development of the sawmill over three years of operations, the wood properties of *P. caribaea* and, the physical resource, existing timber industry and domestic sawntimber market in Fiji, are reviewed briefly as background to the research.

Total sales of sawntimber dimensions amounted to 329 m^3 in 1979, 1132 m^3 in 1980 and 730 m^3 in 1981. The estimated volume of posts and poles sold in specified sizes amounted to 989 m^3 in 1979, 2945 m^3 in 1980 and 2307 m^3 in 1981. Of the total volume of sawntimber sold over three years 27% was 100 x 50 mm dimension framing, 17% was 150 x 50 mm framing and 15% was 100 x 25 mm boards.

The predictive value of these proportions is questioned in light of a significant trend toward smaller dimensions and shorter lengths which is attributed to bucking practices, a dwindling input of presawn native timbers for resale, an increasing dependence on plantation pine with smaller log diameters and technical limitations of the mill itself. This trend is shown continuing through to December 1981 with no sign of having reached a new steady state.

Of the total number of post and pole pieces sold over three years, 36% were 2 m x 7 cm, 25% were 2 m x 10 cm and

9% were 3 m x 10 cm (12%, 16% and 10% respectively by volume).

The post sizes 2 m x 7 cm and 2 m x 10 cm form an increased proportion of annual sales as total post and pole sales per annum, increase. The same positive correlation is observed between the proportion of 100 x 50 mm timber by volume, per quarter and the total sawntimber volume sold, per quarter.

A. INTRODUCTION

The research detailed in this report was undertaken in Fiji for the Fiji Pine Commission (F.P.C.) at their Drasa timber yard and was based on sales records kept since sawntimber production began there in January 1979. The data capture phase was completed between November 1981 and February 1982 and covered all sales of sawntimber, posts and poles on the domestic market up to December the 31st 1981.

The first objective of the study was to establish, in what proportions the major timber products, supplied from Drasa, are sold and the significance of these proportions.

The second objective was to provide an examination of factors influencing relative sales and of the degree to which demand can be inferred, from an analysis of sales. Eventually this type of information will be used by the F.P.C. management to determine optimal product ratios for stock and to more confidently prescribe longer production runs for the local market, further in advance of demand. This will also allow "gearing up" for longer production runs filling specific large export orders which will, in the future, be the more important outlet (in terms of volume) for the Commission's wood resource.

Long term objectives are therefore, to improve cost efficacy through economies of scale in time, to improve the service provided to local timber users and to increase revenues.

Because there was data for just three years available to this research, it can only be seen as a preliminary market study. The results should also be approached cautiously for a number of other reasons. The sawmill operations only began

in 1979and both sawntimber and post and poles production expanded rapidly during these three years. Hence, no market stabilisation with respect to proportions has yet occurred. This situation can be expected to continue at least until production rate of growth more closely resembles the national average. Apparent consumption of sawntimber in Fiji, especially of pine, is projected to go on increasing at least until the year 2000 (WOODBRIDGE, REED & ASSOCIATES, 1981, p.67, chart B). The local market has only recently been introduced to Pine timber with the appearance of the Drasa mill products, and will take some time to adjust its usage patterns to the new species. These patterns will also change as for example, new products such as reconstituted wood panels, penetrate the market and the efficiency of building practices improves.

PRINT B.1.1.

THE FIJI PINE COMMISSION'S SAWMILL AT DRASA DURING UPGRADING OF PLANT AND PROCESS. JANUARY 1982.

B. BACKGROUND INFORMATION

Before interpreting a detailed study of the Drasa mill sales, it is important to appreciate its short history and the physical resource and market context within which it operates.

B.1. THE DRASA TIMBER YARD

The timber yard and sawmill are situated about 10 km north east of Lautoka on the western side of Viti Levu, Fiji's main island. They are in close proximity to the F.P.C.'s Lololo forest which had in 1981 a planted area of 10 464 ha.

Although the first sawnwood was produced at Drasa on temporarily set up equipment in 1979, post and pole sales were already well established. In 1978 this enterprise bought 2 689 cubic metres of roundwood and local demand ran ahead of supply. (F.P.C. Annual Report, 1978).

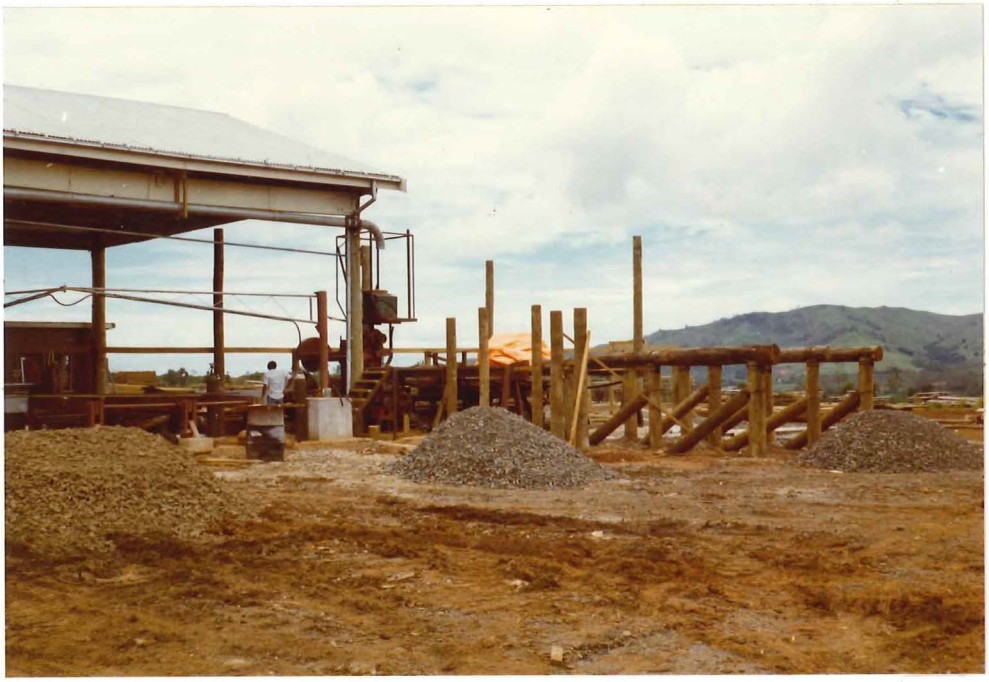
Construction of a pilot sawmill began in 1979. It incorporated a circular head saw in combination with a conventional band saw and was designed to breakdown small to medium size logs.

The new mill was commissioned in March 1980. It had originally been intended as a limited production installation but it was soon realised that with minor modifications it could become a competitive production unit. In its first year, 2400 cubic metres of sawn framing and boards were produced with the new plant, all of which were preservative treated before sale.

The initial production was set back by limited saw doctoring, inexperience of the operators and the second hand breakdown saw which could only handle logs up to 33 cm in diameter. In 1981 trading was so severely affected by the

PRINT B.1.2.

THE DRASA MILL DURING OVERHAUL SHOWING THE NEW HEADRIG AND LOG CARRIAGE, SEMI INSTALLED. JANUARY 1982.



PRINT B.1.3.

THE DRASA SAWMILL NEW LOG DECK & HEADRIG HALF COMPLETED. JANUARY 1982.

world recession and a state of overproduction of sawntimber in Fiji, that the pilot mill was closed down and the opportunity taken to upgrade the facilities. Production did not begin again until 1982. Colour prints (B.1.1, 2 & 3) show the mill during this stage of renovation in January 1982.

B.2. FIJI'S TIMBER RESOURCE.

In 1979 the total area under forest in Fiji is estimated to have been about 870 000 ha. The total commercial forest area was however, only 292 000 ha due to the relatively small proportion of natural forest (30%), which can be considered suitable, or available for commercial production. Of this 292 000 ha, only 49 000 ha was in plantations, comprising exotic species such as pine, mahogony *(Swetenia macrophylla)* and other hardwoods. (Woodbridge, Reed and Associates, 1981).

The total natural forest, merchantable volume was estimated to be about 16 million cubic metres in 1978 (where merchantable referred to any tree of d.b.h.o.b. greater than or equal to 35 cm). Of this volume, 11.5% is in conifers (e.g. *Dakua makadre* {Fijian Kauri} and *D. salusalu*), 38.9% in light hardwoods (Kandamu, Kauvula and Bauvudi) and 49.5% in medium and heavy hardwoods. (op.cit.)

Projections of natural forest sawlog/veneer log production are for an increase of 7.2% per annum, from 1980 levels of 205 000 m^3, to a peak of 290 000 m^3 in 1985. Harvest levels will decline by about 3.2% per annum over the following ten years to a long run sustainable level of between 100 000 and 160 000 m^3 per annum. These predictions could prove unreliable however due to market cycles (harvest levels responding to price fluctuations) and loss of forested land

to other uses such as agriculture, dams and roadways.

Most (77% in 1979) of the plantation areas are in pine, predominantly *Pinus caribaea* var. *hondurensis* (Barret & Golfari) with a little *P. elliottii*. The bulk of the pine resource is managed by the F.P.C., 27 134 ha (72%) in 1979, which had increased to a total planted area of 33 950 ha in 1981.

A policy of much expanded pine afforestation since the early 1970's, adopted primarily by the F.P.C., but also supported by the Forestry Department through its own plantings and its Extension Pine scheme, has resulted in projected yield increases of almost 1000% between 1980 and 1985, and of a further 310% in the following five years for pine sawlog and veneerlog volumes (see Table B.2.1). A sawlog is here defined as having a minimum length of 3.6 m with a minimum small end diameter of 17 cms. Projections of sawlog and veneerlog yield from all sources are summariesed in Table (B.2.1.)

The most likely volume of roundwood output from the F.P.C.'s plantations on Viti Levu alone could be around 110 000 m^3 in 1982 and should easily exceed 1M m^3 by 1995.(op.cit. These figures should be compared with production in 1980, the biggest trading year to date, which totalled 34 717 m^3. This volume included 4 068 m^3 of firewood and 11 400 m^3 of exported pulplogs. (Exports accounted for 44% of production in that year).

During 1980 the forest mensurationists established an MAI of 20 m^3/ha for *P. caribaea* in Fiji and a growth rate which does not decline until well beyond age 15 years. Rotation lengths originally set at 15 years have since been revised upward with a consequent increase in expected sawlog yields. (F.P.C. Annual Report, 1980).

PRINT B.2.1.

PART OF THE FIJI PINE COMMISSION'S RA PLANTATION SEEN FROM THE NADIRIVATU ROAD. JANUARY 1979.

TABLE B.2.1.

FIJI SAWLOG/VENEER LOG YIELD PROJECTIONS. (3)

(000 m^3)

Source	1980(f)	1985	1990	1995	2000
Indigenous Forests (1)	205	290	250	210	160
Plantation Pine					
FPC (2)	5	95	292	n.a.	n.a.
Extension (1)	1	6	20	62	244
Forestry Dept. (1)	6	18	58	78	78
Total Pine	12	119	370	n.a.	n.a.
Plantation hardwoods (1)	1	6	35	110	217
Total Projected Output	218	415	655	n.a.	n.a.

(1) Forestry Department

(2) F.P.C. (July 1980) unofficial projections based on "most likely" plantation areas of 42 000 ha and assuming sawlog size of 17 cms top end diameter under bark (TEDUB)

(f) Forecast

(3) This table including notes (1) & (2) is taken directly from Woodbridge et.al. 1981, p.11.

B.3. THE EXISTING TIMBER INDUSTRY

The timber industry in Fiji is currently based on the harvest of native species and the conversion of this material to sawnwood, veneer and plywood. Production of secondary wood products is limited and there is no domestic production of pulp or paper although there is a paper packaging plant based on imported paper and paperboard. Sawmilling accounts for the bulk of roundwood consumption (see Table B.3.1).

TABLE B.3.1.

FIJI SAWNTIMBER AND VENEER PRODUCTION (1)

(000 m^3)

Production	1975	1976	1977	1978	1979	1980(f)
Sawntimber	57.3	59.1	68.7	74.9	77.3	83.9
Veneer	3.1	4.0	2.6	3.2	4.7	5.0
Total	60.4	63.1	71.3	78.1	82.0	88.9

(1) This table is taken directly from Woodbridge et al 1981, p.27.

(f) Forecast.

The industry is characterized by the high proportion of volume which is processed by a relatively small number of larger mills. (These mills are only large by Fiji standards. The biggest is Fiji Forest Industries/Robb and Brown on Vanu Levu with an output of 25 000 m^3 per annum). A number of producers have outputs of above 9 000 m^3 an^{-1} but there are 40 small and seasonal mills producing very limited quantities.

The indigenous mills are by in large, inefficient in terms of scale, management and marketing. In the 1970's there were no band mills in operation, conversion practices were wasteful and uneconomic, and comparatively high average costs resulted in low returns on investment in the industry (Woodbridge et.al., 1981).

The distribution of mill size, as input volume by frequency, is shown in Table B.3.2 from which it can be seen that the Drasa installation with an output of 1132 cubic metres of sawntimber in 1980 (implying an input of 2576 m^3, assuming a conversion rate of 44%), can be placed at the

TABLE B.3.2.

DISTRIBUTION OF SAWMILL SIZE IN FIJI (1)

Company	Approximate log Intake (1978) (m^3 Round Wood)	Percent of Total Sawmill Intake (%)
Large mills		
Fiji Forest Industry(3)	26 000 (2)	15.3
Robb and Brown (3)	21 000	12.4
Pacific Lumber	34 500 (4)	20.3
Emperor	17 500	10.3
Viti Timber	19 600	11.5
Union Industries	(5)	n.a.
Total large sawmills	118 600	69.8
Medium Size Mills		
Lal Mohammed	7 700	4.5
Integrated Forest Ind.	4 500	2.6
Fiji Forest Sawmills (6)	4 400	2.6
Bas Deo (6)	2 700	1.6
D. Singh	2 400	1.4
Total medium size mills	21 700	12.7
Small Size Mills (7)		
Northern Division)		
Western ")	29 700	17.5
Southern ")		
Total small size mills	29 700	17.5
Total Sawmill Log Intake	170 000 (7)	100.0

(1) This table is taken directly from Woodbridge et.al. 1981 p.41. The original source was the Forestry Department Annual Report, 1978, draft.

(2) Net of estimated log intake of 8 990 m^3 for veneer production.

(3) Fiji Forest Industries acquired Robb and Brown during 1980.

(4) Includes some log intake for veneers. Figure shown was initial estimate. Subsequently it was advised by Forestry Department that log intake in 1978 was 25 100 m^3.

(5) Log intake of this company is significantly below minimum allowable cut.

(6) Apparently managed jointly.

(7) Includes numerous small sawmills of varying log intake.

bottom end of the medium size class. Improvements to plant in 1981 will mean a steadily rising ranking.

B.4. THE DOMESTIC SAWN TIMBER MARKET.

B.4.1 The F.P.C.'s Marketing Position

The consultants (Woodbridge et.al., 1981) have estimated that the 1979/80 apparent consumption of sawntimber in Fiji was 70 466 m^3. The annual average output to the local markets of the Drasa sawmill from 1979 to 1981 was 730 m^3 (source: Table D.2.1.1) or approximately 1% of the national consumption. The national figure however understates a long-term upward trend which was reduced by a demand slump in the late seventies. (Similarly the upward tending Drasa mill sales were affected by a local market recession 1981) (see Fig. D.1.1.)

In the 1950's Fiji depended on imports of sawnwood for 50% of its needs but has been virtually self sufficient since the governments prohibited imports order of 1975. The Forest Department has developed a tentative marketing strategy in anticipation of the increasing availablity of pine timber on the domestic market which has been outlined in three phases.

Phase 1. Up to 1980 or 1984. During this period the increase in plantation timber supply will be absorbed by the local market and will provide for most of the increase in local demand for sawnwood.

Phase 2. 1986 to the early 1990's. Pine will begin to displace native species in increasing quantities.

Phase 3 from the end of phase 2 onward, plantation timbers, it is hoped, will dominate the domestic market with native spp. meeting mainly specialized markets.

During the 1980's however the domestic market is expected to be the most important to the Forestry Department and Extension pine plantations, while the F.P.C. resource will go mainly into export markets, either as roundwood or in some primary processed form (Woodbridge et.al., 1981).

B.4.2.THE POTENTIAL IMPACT OF PINE ON DOMESTIC MARKETS

As pine becomes ever more available on local markets, it will begin to substitute for native timbers in some end uses more than others. A 1972 F.A.O. report (quoted by Woodbridge and Co. 1981) predicted the following pattern of displacement.

In building and construction, softwoods now used mainly for joinery will probably be replaced by pine where this is painted, and also by the light to medium hardwoods (e.g. kauvula and daumanu). The hardwoods will be used more for decorative panelling or for uses requiring high strength properties.

Functionally, pine could replace all species at present used in furniture manufacture, and probably will, in low cost items. Pine will probably replace light hardwoods for structural use but these will in turn, take part of the present demand for native softwoods, which will also tend to be replaced by substitutes such as veneered particle board in table tops, book shelves and side boards.

With Kauvula becoming increasingly scarce, Pine will readily take its share of the packaging market allowing however, for the continued use of medium hardwoods in pallets and wooden crates requiring high strength.

Table B.4.2.1 shows the relative use of the different native species groups for various building construction uses as recorded during 1979 and the estimated merchantable volume

of these groups in native forests in 1978. The Forestry Department indicates that softwoods (e.g. *Dakua makadre*) now represent a much smaller percentage of construction usage. From the table it can be seen that this resource had the highest consumption and least standing volume around 1978-79. It is in substituting for softwoods that *P. caribaea* can make its greatest contribution. There is still a significant resource of light hardwoods and *P. caribaea* can expect some competition from these native species in their traditional markets where it will also be disadvantaged by its higher production costs. The conflict will be partly avoided by the F.P.C.'s initiative in developing export markets.

TABLE B.4.2.1.

ESTIMATES OF 1979 (1) SAWNWOOD CONSUMPTION IN BUILDING CONSTRUCTION AND THE ASSOCIATED STANDING TIMBER RESOURCE BY SPECIES GROUPS IN 1978 (2).

Species Group	U S A G E				Standing Timber (3)
	Const-ruction	Joinery	Formwork	Total	
Softwoods/ Conifers (4)	12.295	2.700	-	14.995	1 340
Light hardwoods	9.220	1.625	8.135	18.980	4 520
Medium "	6.145	0.550	0.905	7.600	2 833
Heavy "	3.075	0.550	-	3.625	2 914
Total	30.735	5.425	9.040	34.200	11 607

(1) 1979 is an average of 1978 and the 1980 forecast.

(2) This table has been constructed from two tables in the Woodbridge report (op.cit.) pages 23 & 53. All volumes are in 000 m^3.

(3) Only trees over 35 cm d.b.h.o.b. were included and volumes are under bark, (an allowance of 15% was made for bark when converting volumes of standing trees. No allowance was made for defect.

(4) "Softwoods" appear in the Usage table and "Conifers" in the standing timber table.

B.5. THE WOOD PROPERTIES AND UTILISATION OF *PINUS CARIBAEA* VAR. *HONDURENSIS*

The species is known to vary significantly in its density but conservative estimates suggest an average basis density of 420 kg/m^3 for immature trees and higher values could be expected with increasing age. The pith is narrower than that of *P. radiata* with, consequently, a less adverse effect on utilization, (Alston, 1980).

Preservative treatment is required for building use. The timber is amenable to Boron diffusion and also treatment by the "Q" process which involves steaming, holding under cover for a few days followed by the conventional full cell pressure process. Susceptibility to blue stain in Fiji's tropical climate, necessitates prompt extraction, conversion and anti-sapstain dipping. An insecticide is mixed with the dip to control pinhole borer attack.

Air seasoning is possible but cover is recommended. The species is characterised by spiral grain which affects individuals to a varying degree and necessitates seasoning under restraint to avoid degrade due to twist. During conventional kiln and high temperature drying, a weighting of 1000 kg/m^2 of stock surface is essential to minimise twisitng of framing sizes. The timber in 50 mm dimensions will dry to 30% m.c., ready for pressure treatment, within three weeks under cover and a further 6 weeks is required to reach 25% following treatment. The wood working properties of *P. caribaea* compare unfavourably with those of the native timbers, due to its knot defects and high resin content. The resin adheres to blades and cutters and the resin streaks, where they occur, make paint finishes difficult to apply. The wood does however take stains well, due to its natural light and even colour. Annual growth rings are not

clearly defined and the timber is characterised by multiple false rings. (op.cit.)

Strength tests conducted by the New Zealand Forest Research Institute, show *P. caribaea* to be superior to N.Z. grown *P. radiata* in strength and a little inferior in stiffness. When comparing visual and stress graded timber on a cut-of-log basis, the Fijian pines *(P. caribaea* and *P. elliottii)* were found superior to N.Z. grown Southern pines and Central North Island Radiata pine.

"The better quality of the Fijian timbers is due to their uniformly small average branch size and their relatively high (by N.Z. standards), basic wood densities." (Whiteside, 1976).

"Both Fijian timbers are clearly suitable for framing and structural applications." (op.cit).[1]

Peeling tests conducted on *P. caribaea* give no reason to suggest that it cannot be veneered (when billets of sufficient size become available), although bow in small diameter material may be a problem. (Alston, 1974).

Numerous pulping tests have been carried out on the species. The quality of the best unbleached pulp was found equivalent, or slightly inferior to unbleached American Southern Pine commercial pulps and was considered suitable for most grades of kraft paper on the local market, but perhaps difficult to export, by workers from the Tropical Products Institute. (Palmer and Gibbs, 1968). The same authors (1971), tentatively suggest that a bleached pulp of adequate strength and brightness for writing and printing papers, might be produced with sophisticated bleaching techniques.

The Woodbridge report (op.cit.) however, gives production of market pulp for export only a medium rating on the basis of

(1) See also Density Studies by Maddern Harris 1976

Fiji's comparative advantage in other wood products (e.g. pulpwood, sawlogs and woodchips.) The extent of the local market infrastructural, technical and industrial support inadequacies mean that pulp production with integrated paper capability for the local market, is not a likely development in the near future.

Other uses for which *P. caribaea* has been found suitable include, roundwood, preservatised for fence posts, passion-fruit poles, house pilesand poles for pole frame housing. Large scale, national electrification and communication projects at present under construction (e.g. the hydro electricity and Irrigation scheme at Monasavu) will create an increased demand for transmission poles.

The Forestry Department has prepared a very detailed set of guidelines for the preparation of *P. caribaea* poles which includes demanding seasoning, selection, preservative treatment, taper, strength, weight, and moisture content specifications. Research has also shown the species suitable for particleboard, blockboard, wood wool cement and plywood, (Alston, 1980).

Details of standard dimensions of sawntimber available in Fiji are given in Appendix A.B.5.1 .

Details of standard Post and Pole sizes available at Drasa are shown in appendix A.B.5.2 and the specifications for Pine poles, taken from the Forestry Department guidelines are given in appendix A.B.5.3.

PRINT B.5.1

TIMBER GRADING DURING STOCK QUALITY ASSESSMENT BY SAMPLING. NOTE WEIGHTED PACKETS OF SEASONING TIMBER AWAITING EXPORT IN BACKGROUND. FEBRUARY 1982.

C. METHOD OF STUDY

C.1. THE RAW DATA

Carbon copies of original sales invoices for sawn timber and posts and poles sales from the Drasa timberyard comprised the bulk of the raw data for this study. Copies of the standard invoice forms used are shown in appendicies A.C.1.1 and A.C.1.2, each of which recreates a hypothetical sale typical of the originals.

The sales records covered the period from the 1st of January 1979 to the 31st of December 1981. At time of sale there existed three carbon copies of each invoice. The bottom-most version was stored, undetached from the original invoice book at the Sales Office of the timberyard, where it was accessed during this research.

There are three separate categories of sales maintained by the Sales Office, each with its own series of invoice books for both sawntimber and posts and poles (i.e. six series in all). They are for "Cash", "Credit" and "Internal" transactions.

Details of the stock levels at the end of 1981 were obtained from a routine stocktake made by the sawmill staff and dated 31st December 1981.

C.2. DATA AGGREGATION

C.2.1 Sawntimber

The sales data was brought together in a number of stages to arrive at a table which recorded separately, total sales of each dimension over the three year period. For each dimension the total number of pieces sold in each length class was totalled as well as, that total volume of pieces for which no length had been individually assigned. For

each dimension the total number of pieces, total linear metres and total volume were also summed.

At the first stage individual sales were aggregated by dimension for each month but still differentiated on the basis of grade, treatment and species. For 1979 only the total volume of Internal sales in each month was noted but from January 1980 the first level aggregation was made separately for each of the three sales categories.

At the second stage, the grade, species and sales categories were aggregated to form a monthly summary of dimension by length class with totals of pieces, linear metres and volume.

The third stage totalled the thirty-five monthly summaries (there were no sales during February 1979) into three, yearly summaries with the same level of detail which was also taken through to stage four, the three-year, overall total already described.

Details of the dollar values of sales were transcribed from the original invoice copies to stage one but further analysis was outside the scope of the present project which deals with sales levels only in physical quantities (Volumes and numbers of pieces).[1] Also not taken beyond stage one, were three dimension categories most frequently sold as "packets" or "loads" of unspecified volume and apparently (from price evidence) of varying unit value, viz. "facecuts" "shorts" and "firewood". As these products are largely unavoidable arising from the milling process, little has been lost in terms of outturn control information by their absence from the final calculation of product proportions.

The method of estimating volumes by working back from price clues or other related values such as piece lengths, total pieces and/or total linear metres had to be applied

(1) See appendices (C.2.1.1, & 2) for Price Information.

frequently where the bottom layer carbon copies (especially those from 1979) were too faint in places and the digits illegible. This source of error at the first stage was however of insufficient magnitude to significantly affect the final ratios between products calculated or the conclusions reached from them.

The final sawntimber sales tables which appear in the results (section E) and the appendices have all been derived from the summary tables of data aggregation stages two to four. The treatment and grade information retained to stage one was unnecessarily detailed for the specific objectives of this analysis, but the data has been made available elsewhere, for the F.P.C. records.

C.2.2. Posts and Poles

A similar procedure of aggregation in stages was followed with the local market roundwood sales. The annual summaries and overall summary of sales from stages three and four appear in appendix tables (A.D.3.1 to A. D.3.8).

Large volumes of roundwood were sold as firewood over the three years (1) and some loads of slabwood for this use were also recorded on post and pole invoices. A small amount of Eucalypt roundwood was sold over the three years but actual piece volumes could not be determined as sales were most often measured in linear metres only. Due to the lack of specific piece size information, firewood, eucalypts and a further category (recorded as "established fund" and appearing only during 1979) have been excluded from the final calculation of product sales proportions. They are, in any

1. 4068 m^3 (11.7%) of total log production was sold directly for firewood in 1980 and the market continues to expand. (F.P.C. ANNUAL REPORTS 1980 & 1981).

case, not of major importance in determining target stock levels for the post and pole yard. The sales categories were, as for sawntimber, aggregated from stage two onward.

The same problem of legibility was encountered and errors in the analysis may also have arisen, from estimates made necessary where invoices were occasionally ambiguously and/or inconsistently written. For example it was not always clear whether a figure was meant to represent number of pieces, a length measurement in linear metres or a diameter measurement in centimetres. Prices of items sometimes seemed unrelated to quantities. The sawntimber invoice forms are better designed in this respect. No doubt the situation has improved with the now routine transferral of sales data to the head office, computer based information system in Lautoka.

The accuracy of post and pole sales proportions is therefore, probably less than those for sawntimber but again the validity of the broad results will not have been affected.

C.3 THE ANALYSIS

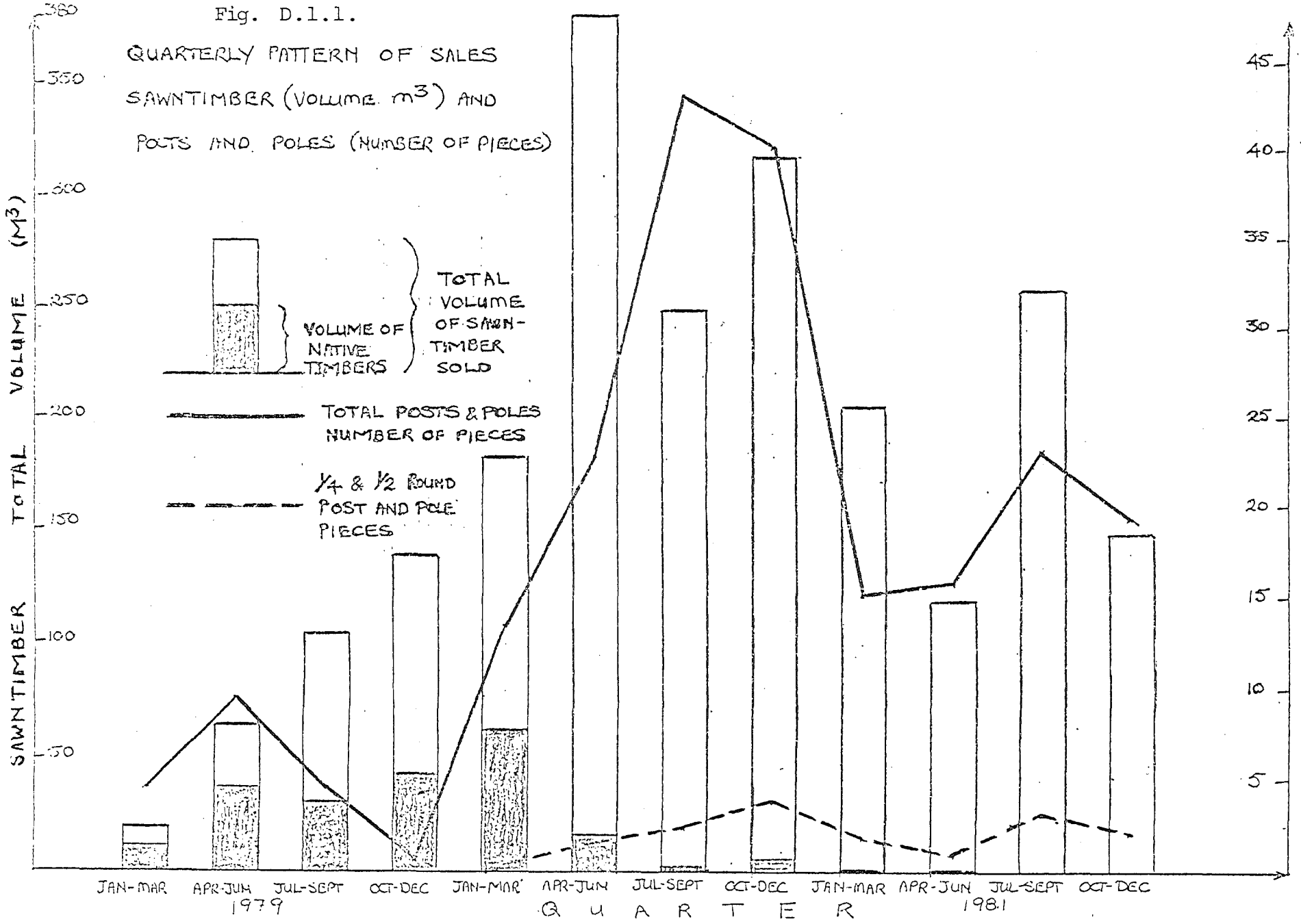
From the two, three-year, overall aggregations, the ten top selling product categories were selected on a volume basis for sawntimber and on a number of pieces basis for posts and poles. These measures were selected as being those most familiar in everyday management of the timber yard.

Subsequent analysis dealt only with the top ten products with the rest classed simply as "others". The proportions of sales calculated are "actual", as opposed to "estimated" means, since the assessment technique of complete enumeration has been employed. The computation of a mean monthly proportion for different products would have been inappropriate as the

35 or 36 months involved do not represent, a sufficiently independent random sample over a sufficiently large population. An attempt has been made instead to show the sometimes extreme variability in relative proportions and actual quantities graphically and in summary tables which do in fact reveal trends that would have been obscured by estimates of standard error alone.

Fig. D.1.1.

QUARTERLY PATTERN OF SALES SAWNTIMBER (VOLUME m^3) AND POSTS AND POLES (NUMBER OF PIECES)



D. RESULTS WITH COMMENTARY ON THE ANALYSIS

D.1. All sales

The variation in sales of all sawntimber, posts and poles over the three years (1979-81) by quarterly periods is shown in Fig.(D.1.1.)It should be noted that sawntimber is in terms of volume and roundwood is shown as number of pieces. This graph has been derived from appendix table (A.D.3.8) and table (D.2.2.1.) The post and pole volume was in fact about 2.8 times greater than sawntimber volume, sold over the whole three years (see tables D.2.1.1 & D.3.1.2.)

Sales of both products follow the general pattern of a steady rise through 1979 as the mill increased production and its share of the local market. Sales peaked in 1980 and fell off during 1981. This downturn has been attributed by the F.P.C. management to the worldwide recession and a serious state of over-production of timber in Fiji.(F.P.C.1981)

The increase in sales during the third quarter of 1981 might be explained by a seasonal effect, but other factors such as the recent entry of the mills' products to the market, the unpredictability of the start and duration of the rainy season, the influence of the whole economy on sales and the relatively short period being observed, confound clear detection of any seasonal affect.

Other points to note are the high proportion of native light and medium hardwood timber that was sold through 1979 but which had fallen to insignificance by 1981, and the introduction of resawn posts (¼ and ½ rounds) in 1980.

D.2. SAWNTIMBER

D.2.1 Top selling dimensions

Table (D.2.1.1)shows the relative sales of the top ten sawntimber dimensions, where the "top ten" have been chosen

TABLE D.2.1.1

SAWNTIMBER: ABSOLUTE QUANTITIES AND PROPORTION OF SALES AND STOCK BY VOLUME IN THE TOP TEN DIMENSIONS AS PERCENT OF TOTAL (1)

DIMENSION	Y E A R						OVERALL VOLUME (1)		STOCKTAKE VOLUME (2)		OVERALL (2 YRS) EXCL. INTERNAL SALES VOLUME	
	1 9 7 9 (1)		1 9 8 0 (1)		1 9 8 1 (1)							
	Vol.(m^3)	Vol.(%)	Vol.(m^3)	Vol.(%)	Vol.(m^3)	Vol.(%)	(m^3)	(%)	(m^3)	(%)	(m^3)	(%)
100 x 50	62.7034	18.8947	395.6805	34.9527	135.1275	18.5145	593.0114	27.0657	595.1051	41.770	516.9340	31.639
150 x 50	113.0822	34.3495	183.9289	16.2475	71.8965	9.8509	368.9076	16.8373	218.081	15.307	233.1503	14.270
100 x 25	15.2940	4.6455	102.8911	9.0890	200.6408	27.4908	318.8259	14.5516	106.879	7.502	251.3875	15.386
75 x 50	25.4441	7.7288	84.8857	7.4984	77.7866	10.6579	188.1165	8.5858	140.270	9.846	155.9598	9.546
50 x 25	32.6673	9.9229	87.5118	7.7304	23.3399	3.1979	143.5190	6.5504	0.129	0.009	13.1527	0.805
75 x 25	1.6599	0.5042	60.2955	5.3262	68.8472	9.4331	130.8026	5.9700	56.795	3.986	127.3922	7.797
150 x 25	12.6315	3.8369	42.4718	3.7518	38.2219	5.2370	93.3252	4.2595	40.647	2.853	69.3361	4.244
100 x 75	9.1350	2.7748	31.3560	2.7699	24.3248	3.3329	64.8158	2.9583	166.421	11.681	51.5416	3.155
150 x 75	9.7774	2.9700	27.8708	2.4620	20.0678	2.7496	57.7160	2.6342	68.675	4.820	40.7567	2.495
200 x 50	18.3060	5.5606	30.5610	2.6996	0.0000	0.0000	48.8670	2.2303	15.105	1.060	27.5280	1.685
OTHERS	29.0094	8.8118	84.5911	7.4724	69.5935	9.5354	183.1020	8.3570	16.6035	1.165	146.7112	8.979
TOTALS (1)	329.2102	100.0000	1132.0442	100.0000	729.8465	100.0000	2191.1009	100.000	1424.7105	100.000	1633.8501	100.000

(1) Source: Appendix table (A.D.2.2.1.)

(2) Source: Appendix table (A.D.2.1.2.)

on the basis of volume of sales over three years. These dimensions are not necessarily therefore, the top ten, in each year; e.g. 225 x 50 mm was the eighth biggest seller in 1979 but does not enter the top ten over all. The highest rank achieved by any dimension not included in the overall top ten, was seventh (75 x 10 mm in 1981). The data from this table are represented graphically in Figs (D.2.1.1 to D.2.1.3).

The effect of the overall sales peak in 1980 on all dimensions can be seen in Fig (D.2.1.1) with the notable exceptions of 100 x 25 mm and 75 x 25 mm, which increase their actual sales volume in 1981 against the overall trend.

Sales as a proportion of the years total volume for the top ten dimensions are presented in Fig (D.2.1.2) which shows how great was the year to year variation of relative proportions, around the overall proportions. This variation completely alters the proportionate ranking in different years.

Fig (D.2.1.3) relates the relative proportions of dimensions in stock (as at December 1981) to actual sales levels. The best agreement achieved by stock proportions is with the 1980 sales when internal sales are excluded (see also table (D.2.1.1). The 1979 and overall levels bear little relation to the stock, although naturally the latter is closer. This result is understandable if the mill management was basing its 1981 and late 1980 production on sales during the "boom" year of 1980. Also the 50 x 25 mm dimension is produced mainly for internal use (as fillets) and does not therefore appear in either stock or external sales.

The proportion of 100 x 75 mm material in stock was however completely over anticipating likely sales on any basis. This dimension can be resawn to 100 x 50 mm or

Fig.D.2.1.1: Sawntimber

ANNUAL SALES BY VOLUME IN THE TEN SIZE CLASSES OF SAWNTIMBER SELLING THE GREATEST VOLUME OVER THE THREE YEAR PERIOD

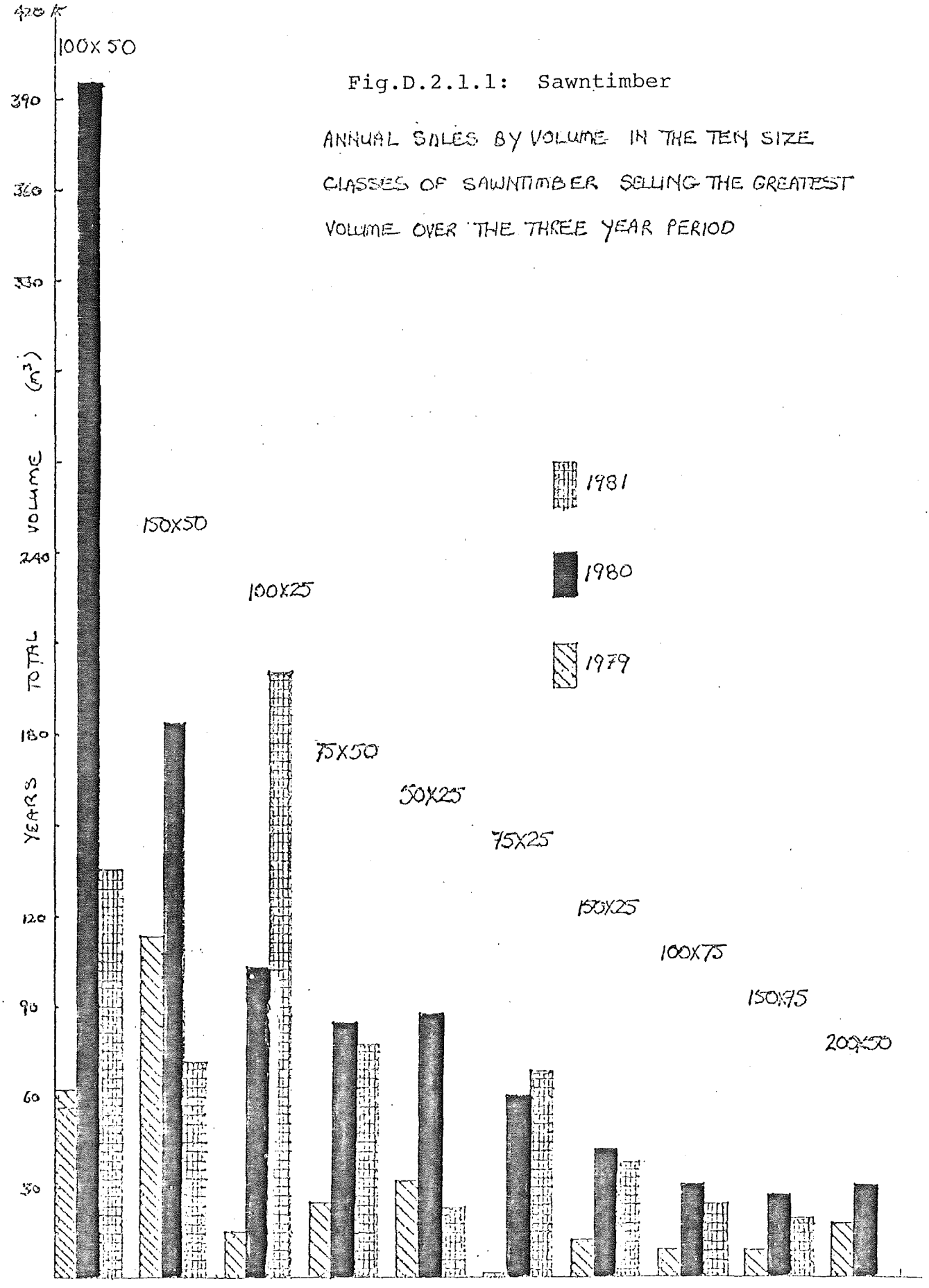


Fig.D.2.1.2 SAWNTIMBER

PROPORTION OF SALES BY VOLUME FOR THE TOP TEN DIMENSIONS OVER THREE YEARS AS A PERCENTAGE OF THE OVERALL TOTAL VOLUME AND THE TOTAL VOLUME IN EACH YEAR

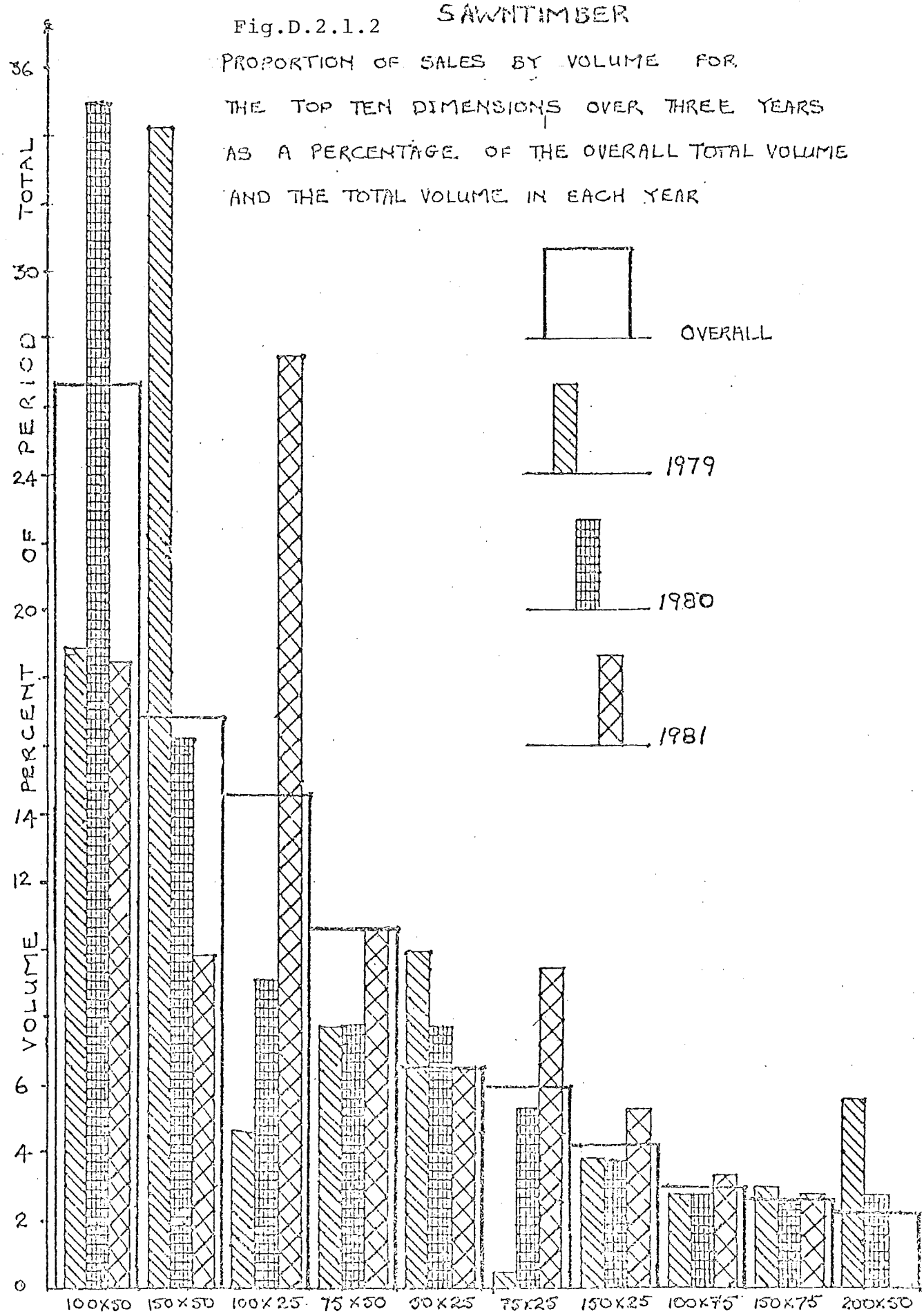
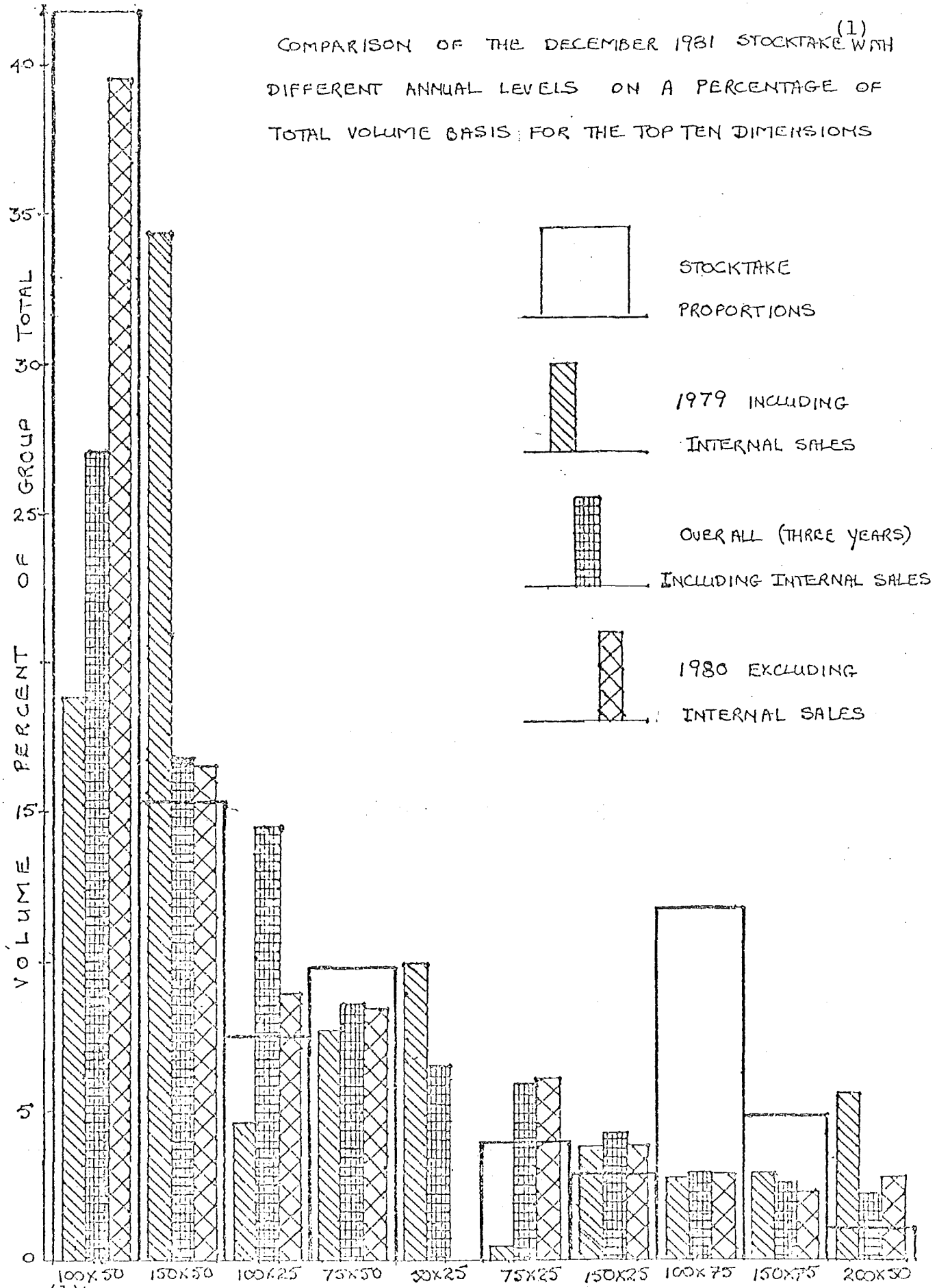


Fig. D.2.1.3

Sawntimber



(1) Source of stocktake data; appendix table (A.D.2.1.2)

100 x 25 mm and potential demand for the latter might have absorbed some of this breakdown, but the former was already adequately stocked, and there is a cost in double handling which could have been avoided. Stock levels of 200 x 50 mm dimension were only half what they should have been by a proportion of sales criterion. Other departures in stock from these "best fit" sales proportions are probably not significant considering that, although the most relevant measure, they cannot in the short space of three years be considered a long term, stable, equilibrium "mix".

D.2.2 Trends in the relative sales proportions of dimensions.

Table (D.2.2.1.) shows the relative movement of the ten top selling dimensions over the three years as per cent of total volume in each quarter, and has been derived from appendix table (A.D.2.2.1) where the same information is given by months.

The main trends in relative sales are adequately represented within the top three dimensions alone (i.e. 100 x 50 mm, 150 x 50 mm and 100 x 25 mm). The pattern of changing proportions for these three are shown in Fig. (D.2.2.1.) against the total volume in cubic metres for each quarter.

The large dimension (150 x 50 mm) shows an overall significant fall in its proportion of sales while the smallest dimension (100 x 25 mm) shows an overall increase, during the three years. This effect is fairly general as can be seen from table (D.2.2.1) where the smaller dimensions are taking an increasing proportion of sales with time. The second quarter of 1981 may be exceptional due to the effect of other unrelated market factors on the very much reduced total volume sold in that quarter. As already mentioned, the demand for 50 x 25 mm

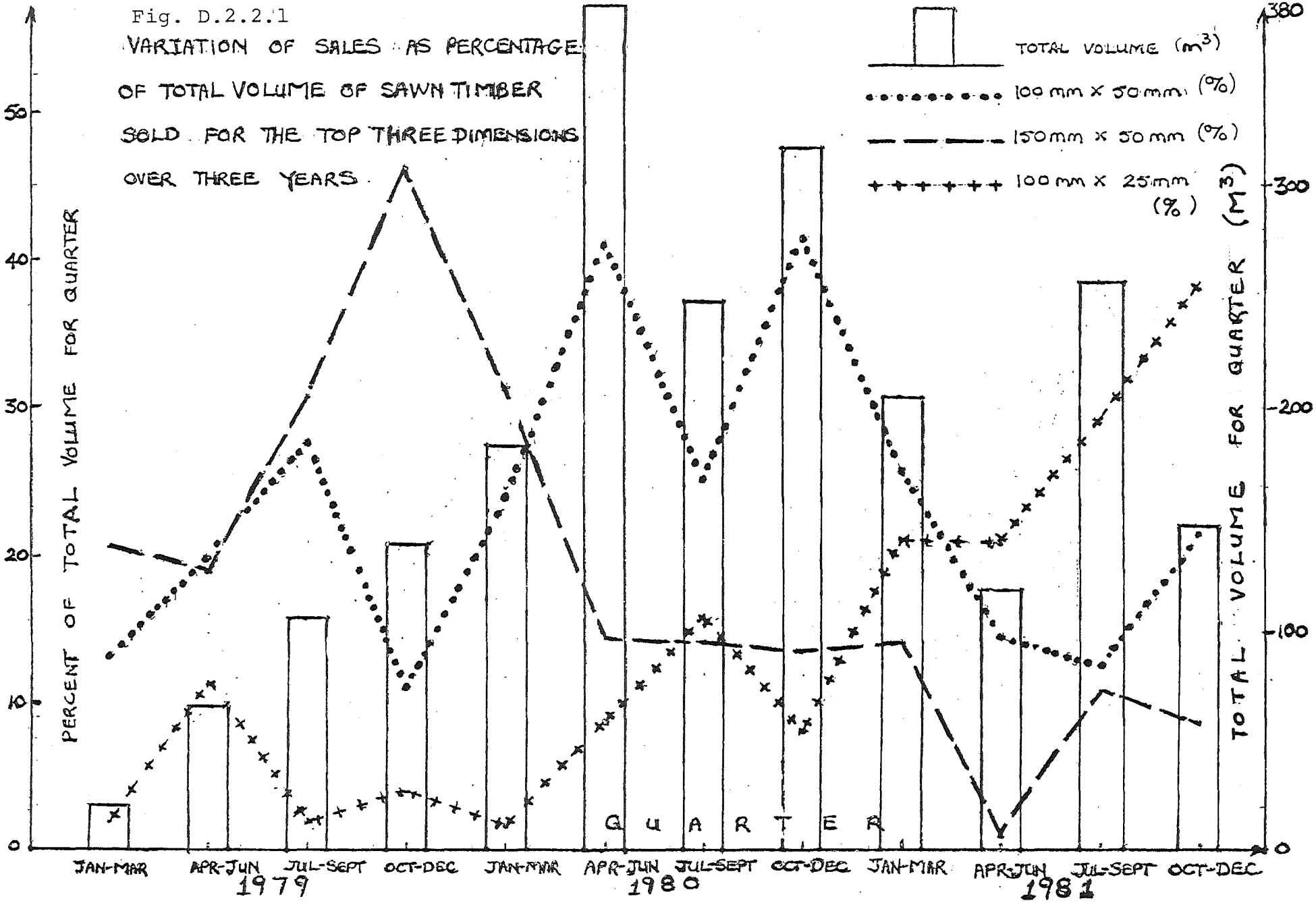
TABLE D.2.2.1.

SAWNTIMBER: PATTERN OF QUARTERLY SALES: PERCENT OF TOTAL VOLUME FOR THE QUARTER, TOP TEN DIMENSIONS

QUARTER	D I M E N S I O N S											TOTAL	HW[1] VOL.
	100 x 50 Vol.(%)	150 x 50 Vol.(%)	100 x 25 Vol.(%)	75 x 50 Vol.(%)	50 x 25 Vol.(%)	75 x 25 Vol.(%)	150 x 25 Vol.(%)	100 x 75 Vol.(%)	150 x 75 Vol.(%)	200 x 50 Vol.(%)	OTHERS Vol.(%)	(m^3)	(%)
JAN-MAR.'79	13.074	20.605	1.861	10.906	0.0	0.0	3.992	0.591	0.0	3.202	45.769	19.0223	11.8735
APR-JUNE.	19.863	18.946	11.449	6.131	24.875	0.966	3.204	1.546	0.0	0.0	3.020	65.7676	37.3945
JUL-SEPT.	27.840	30.810	1.858	11.210	10.848	0.945	1.235	2.619	4.034	3.163	5.439	105.5770	30.7502
OCT-DEC.	11.097	46.220	3.924	5.404	4.831	0.0	1.357	3.774	3.974	10.341	9.076	130.8433	44.0607
JAN-MAR.'80	23.908	31.338	1.702	9.008	3.238	0.460	5.227	2.499	2.104	8.501	12.017	183.8705	63.2230
APR-JUNE	41.190	12.532	8.759	6.538	6.678	4.508	3.833	4.366	1.773	3.419	6.404	382.2974	15.9949
JUL-SEPT.	25.066	14.147	16.170	5.059	12.417	9.388	5.154	1.638	5.186	0.502	5.274	248.4797	2.5575
OCT-DEC.	41.578	13.626	8.222	9.691	7.932	5.951	1.702	1.891	1.367	0.228	7.812	317.3967	5.6871
JAN-MAR.'81	25.768	14.236	21.175	13.391	3.821	10.118	3.984	1.558	1.189	0.0	4.759	205.1653	0.4072
APR-JUNE	14.583	1.018	20.969	13.682	2.099	5.202	6.979	13.822	12.892	0.0	3.559	119.0915	0.4489
JUL-SEPT.	12.751	11.038	29.144	8.499	0.754	15.312	4.310	0.535	0.246	0.0	7.411	257.6463	0.0
OCT-DEC.	21.658	8.812	38.621	8.193	7.475	2.442	7.187	2.222	1.109	0.0	4.724	147.9434	0.0

(1) HW refers to the volume of Sawn Timber from Native Species sold and forms a proportion of the Quarterly Totals.

Fig. D.2.2.1


VARIATION OF SALES AS PERCENTAGE OF TOTAL VOLUME OF SAWN TIMBER SOLD FOR THE TOP THREE DIMENSIONS OVER THREE YEARS
TOTAL VOLUME (m3)
100 mm x 50 mm (%)
150 mm x 50 mm (%)
100 mm x 25 mm (%)
PERCENT OF TOTAL VOLUME FOR QUARTER
TOTAL VOLUME FOR QUARTER (M3)
0
10
20
30
40
50
0
100
200
300
380
JAN-MAR
APR-JUN
JUL-SEPT
OCT-DEC
1979
1980
1981
QUARTER

dimension is largely internally generated. Production tends to be in large, infrequent lots.

The medium dimension (100 x 50 mm), shows another pattern in time which is unique amongst the top ten. With its highest proportions of sales occurring during 1980, its share of the market seems postiively correlated with the total volume of all sawntimber sold, which implies that sales of this dimension will increase faster (probably up to some equilibrium limit) as local demand for the mill's output grows. Note however, that the association is not perfect . The 100 x 500 mm proportion fell against rising total sales in the fourth quarter of 1979 and again in the third quarter of 1981.

D.2.3 The effect of excluding internal sales.

This section of the analysis shows firstly that the ranking of products by internal sales differs significantly from that in the external market. Secondly, that internal sales or at least a part of them, should be more predictable than external sales. For example, they include such products as 50 x 25 mm fillets and 150 x 50 m pieces used in the construction of "stack-horses" (on which packets of timber are stacked clear of the ground while seasoning). The consumption of those items depends on a predictable "life" expectancy and maximum levels of inventory, within the timberyard itself.

Table (D.2.3.1) shows the volume and percentage of volume in external sales for 1980, 1981, both these years together and for comparison, the stocktake; by dimension. Details of internal sales by dimension for 1979 were not recorded at stage 1 of the data aggregation, however the

TABLE D.2.3.1.

SAWNTIMBER: PROPORTION OF SALES AND STOCK BY VOLUME EXCLUDING INTERNAL SALES, FOR THE TOP TEN DIMENSIONS (4)

DIMENSION	Y E A R				OVERALL (2 YEARS) VOLUME		STOCKTAKE VOLUME	
	1 9 8 0		1 9 8 1					
	m^3	%	m^3	%	m^3	%	m^3	%
100 x 50	388.3920	39.551	128.5420	19.720	516.9340	31.639	595.105	41.770
100 x 25	88.1192	8.973	163.2683	25.047	251.3875	15.386	106.879	7.502
150 x 50	163.3713	16.636	69.7790	10.705	233.1503	14.270	218.081	15.307
75 x 50	82.7688	8.428	73.1910	11.228	155.9598	9.546	140.270	9.846
75 x 25	59.6555	6.075	67.7367	10.392	127.3922	7.797	56.795	3.986
150 x 25	38.1408	3.884	31.1953	4.786	69.3361	4.244	40.647	2.853
100 x 75	28.4207	2.894	23.1209	3.547	51.5416	3.155	166.421	11.681
75 x 10	10.5409	1.073	31.6829	4.861	42.2238	2.584	0.0	0.0
150 x 75	22.2582	2.267	18.4985	2.838	40.7567	2.495	68.675	4.820
200 x 50	27.5280	2.803	0.0	0.0	27.5280	1.685	15.105	1.060
OTHERS	72.8200	7.415	44.820	6.876	117.6400	7.200	16.732	1.174
TOTAL(1)	982.0153	100.000	651.8348	100.000	1633.8501	100.000	1424.710	100.000
							1979 (3)	
TOTAL(2)	1132.0442	100.000	729.8465	100.000	1861.8907	100.000	329.210	100.000
INT. SALES	150.0289	13.253	78.0120	10.689	228.0406	12.248	105.574	32.069

(1) Total of all sales excluding Internals.

(2) Total of all sales including Internals.

(3) Details of Internal Sales were not collected for 1979, but total volume was recorded.

(4) The top ten dimensions are based on overall volume for 1980, plus 1981 and excludes Internal Sales.

total volume of internal sales in 1979 was noted and from this table it can be seen that the proportion of total volume consumed internally was almost three times higher in 1979 than in the two subsequent years where it seems to have levelled off at about 12%.

The "top ten" in this case have been determined on the basis of contribution to the total volume of external sales for 1980 and 1981. As a consequence the ranking of the top ten has changed but most significantly the 50 x 25 mm dimension no longer features and the 75 x 10 mm dimension has entered as eighth in rank (cf. table D.2.1.1).The appearance of the latter size is in accord with the trend toward smaller dimensions but also partly a result of not including 1979 in which year 75 x 10 mm boards were not sold at all. The variability around mean proportions is not comparable, to that when internal sales are included (see Fig D.2.3.) again because 1979 is not included.

Table (D.2.3.2) presents the variation in sales proportions for external sales by quarters for 1980 and 1981 and is derived from appendix table (A.D.2.3.1.) The same trends that are evident in Fig.(A.D.2.3.2) are again followed by the external sales, (see appendix A.D.2.3.2.)

D.2.4 The distribution of sales over length of piece.

In Table (D.2.4.1) sales by volume are shown with respect to their distribution over the standard length classes, for each year, overall (three years) and for the 1981 stocktake. The same information by number of pieces is given in appendix table (A.D.2.4.1.). Fig. (D.2.4.1.) compares the total sawntimber distributions by volume and by number of pieces. The former is of course weighted toward the higher length classes as length directly affects volume

TABLE D.2.3.2.

SAWNTIMBER:

PATTERN OF QUARTERLY SALES: VOLUME AND PERCENT OF TOTAL VOLUME; FOR THE QUARTER EXCLUDING INTERNAL SALES;

TOP TEN DIMENSIONS (1)

QUARTER	D I M E N S I O N S (mm)											TOTAL
	100 x 50	150 x 50	100 x 25	75 x 50	50 x 25	75 x 25	150 x 25	100 x 75	150 x 75	200 x 50	OTHERS	
	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	(m^3)
JAN-MAR.'80	25.344	31.940	1.865	10.003	0.504	4.841	2.739	0.0	2.306	9.208	11.244	167.7315
APR-JUNE	45.406	93.023	8.985	7.254	4.998	4.201	4.181	0.0	1.967	3.288	6.702	344.5479
JUL-SEPT.	29.910	17.085	17.184	5.530	11.623	5.874	1.994	1.707	6.429	0.072	2.593	200.4432
OCT-DEC.	48.083	11.390	7.275	11.284	6.799	1.401	2.019	2.644	1.514	0.268	7.324	269.2927
JAN-MAR.'81	27.003	14.862	22.234	13.088	11.117	3.794	1.714	0.600	1.047	0.0	4.541	186.5786
APR-JUNE	14.647	0.556	22.312	13.931	5.478	5.788	14.748	2.910	13.432	0.0	6.199	110.9616
JUL-SEPT.	14.589	13.118	19.856	10.042	17.998	3.867	0.249	12.627	0.0	0.0	7.654	216.4758
OCT-DEC.	21.220	9.122	37.815	8.100	1.367	6.524	2.113	0.0	1.512	0.0	12.226	142.9109

(1) Top Ten are as for Table D.2.1.1.

Fig.D.2.3. SAWN TIMBER

RELATIVE SALES BY VOLUME EXCLUDING INTERNAL SALES

FOR THE TOP TEN SIZE CLASSES

FOR THE YEARS 1980 AND 1981.

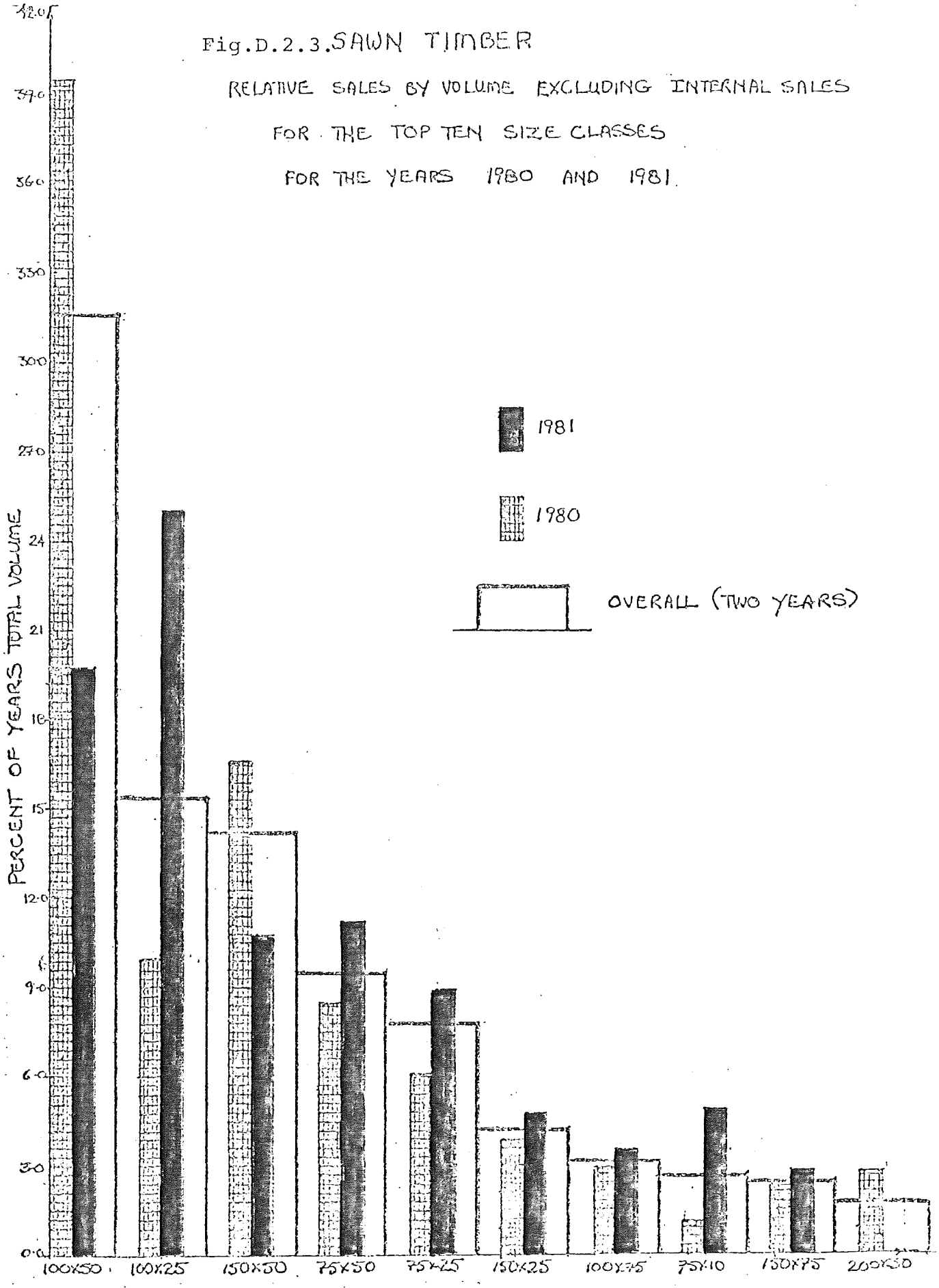


TABLE D.2.4.1

SAWNTIMBER: DISTRIBUTION OF VOLUME OVER LENGTH CLASSES FOR EACH YEAR, OVER ALL THREE YEARS AND FOR THE DECEMBER 1981 STOCKTAKE

LENGTH CLASS	YEAR						OVERALL (1)		STOCKTAKE	
	1979		1980		1981		VOLUME		VOLUME	
	Vol. (m^3)	Vol. %	Vol. (m^3)	Vol. %	Vol. (m^3)	Vol. %	(m^3)	%	(m^3)	%
0.9	1.2213	0.483	0.0	0.0	0.3750	0.053	1.5962	0.073	0.0	0.0
1.2	0.0	0.0	0.4615	0.045	8.7417	1.225	9.2032	0.420	0.0	0.0
1.5	0.0	0.0	0.0199	0.002	0.0350	0.005	0.0549	0.003	0.0	0.0
1.8	2.9903	1.182	18.1044	1.770	13.3028	1.864	34.3921	1.570	30.872	2.167
2.1	4.8083	1.901	32.0208	3.130	27.7845	3.893	64.8221	2.958	53.337	3.744
2.4	8.9783	3.549	55.2422	5.400	43.0149	6.027	107.1427	4.890	116.756	8.195
2.7	15.0299	5.941	70.7257	6.913	53.8190	7.541	139.4570	6.365	33.194	9.349
3.0	20.2248	7.995	106.4695	10.407	76.3659	10.700	202.7358	9.253	192.174	13.489
3.3	26.5517	10.495	130.2587	12.733	77.6636	10.882	234.1826	10.688	169.824	11.920
3.6	31.5136	12.457	161.5589	15.792	96.0215	13.455	288.6186	13.172	124.085	8.709
3.9	22.3506	8.838	150.5326	14.715	216.3355	30.313	390.5381	17.824	385.452	27.055
4.2	24.6804	11.337	78.2068	7.645	25.1713	3.527	128.0337	5.843	55.863	3.921
4.5	24.8922	9.839	54.9119	5.368	17.9994	2.522	97.7502	4.461	50.701	3.559
4.8	15.0240	5.939	42.6928	4.173	18.2604	2.559	75.9771	3.468	45.384	3.185
5.1	15.9121	6.290	32.6507	3.192	9.9276	1.391	58.4956	2.670	23.712	1.664
5.4	15.7226	6.215	26.2216	2.563	13.8673	1.943	55.8120	2.547	23.007	1.615
5.7	11.5604	4.570	41.2998	4.037	4.1900	0.587	57.0486	2.604	9.280	0.651
6.0	10.7813	4.262	21.2382	2.076	10.7918	1.512	42.8105	1.954	10.455	0.734
6.3	0.7325	0.290	0.4017	0.039	0.0	0.0	1.1340	0.052	0.378	0.027
6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.132	0.009
6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.104	0.007
TOTAL (3)	252.9833	100.00	1023.0177	100.00	713.6672	100.00	1989.8050	100.00	1424.7105	100.000
NO LENGTHS (2)	76.2269	23.154	109.0265	9.631	16.1793	2.217	201.2972	9.187	n.a.	
TOTAL (4)	329.2102	100.00	1132.0442	100.00	729.8465	100.00	2191.1022	100.00	n.a.	

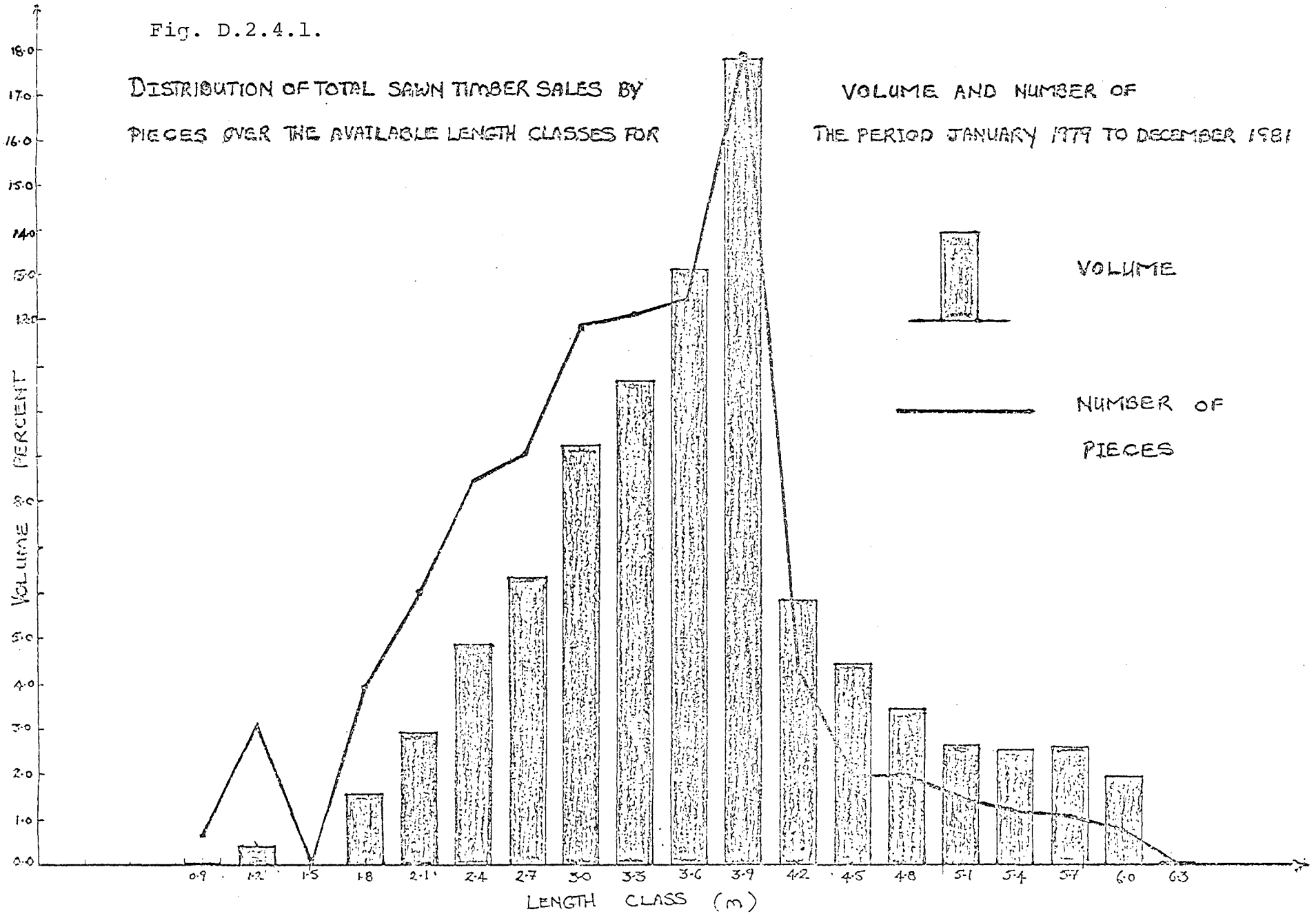
(1) DISCREPANCIES IN TOTAL DUE TO ROUNDING AND AGGREGATION OF VERY SIMILAR DIMENSIONS (e.g. 100 x 40 + 100 x 37.5) INTO AN AVERAGE (i.e. 100 x 39.63). ALSO, 75 x 10 HAVE BEEN INCLUDED IN THE 1980 TOTAL.

(2) PERCENT IS OF TOTAL (4). VOLUME IS OF THOSE PIECES FOR WHICH NO LENGTH WAS SPECIFICALLY ASSIGNED.

(3) TOTAL OF LENGTH CLASSES.

Fig. D.2.4.1.

DISTRIBUTION OF TOTAL SAWN TIMBER SALES BY VOLUME AND NUMBER OF PIECES OVER THE AVAILABLE LENGTH CLASSES FOR THE PERIOD JANUARY 1979 TO DECEMBER 1981



but there is also a less obvious effect of dimensions which will be demonstrated below.

Both distributions have a strong unimodal nature if the gap at 1.5 m and the second, minor mode for volume at 5.7 m, are disregarded. These curves could readily be described mathematically, by Weibull functions which would use the mode, minimum and maximum length class values and the per cent value for the mode.

Note the apparent discontinuity between length classes at 3.9 m and 4.2 m. This can be attributed to a standard bucking practice introduced in 1980 to comply with export market requirements whereby all logs are cut to four and eight metre lengths, on skid. In effect, there was a near truncation in the supply of timber lengths over four metres.

The effect of this policy can also be seen in the trend of thelength class distribution over time (although other factors are also contributing). The shift from a high proportion of sales volume in longer lengths to an increasing proportion in shorter lengths, is shown against the overall distribution by volume in Fig. (D.2.4.2.)

In Figure (D.2.4.3) the distribution as proportion of total pieces is seen as it changed from month to month. The 21 length classes have been aggregated into three groups with a fairly even share of volume in 1979,which begins to alter radically about April 1980 and then shows another shift beginning in the middle of 1981. This graph is derived from appendix table (A.D.2.4.2.)

Comparison of sales with the stocktake distribution of volume over length classes is made graphically in Fig. (D.2.4.4.) The best "fit" of stock levels is achieved with the sales distribution of 1981 and not 1980, as was the case for dimensions.

Fig.D.2.4.2 MOVEMENT OF THE DISTRIBUTION OF VOLUME OVER LENGTH CLASSES FROM 1979 TO 1981

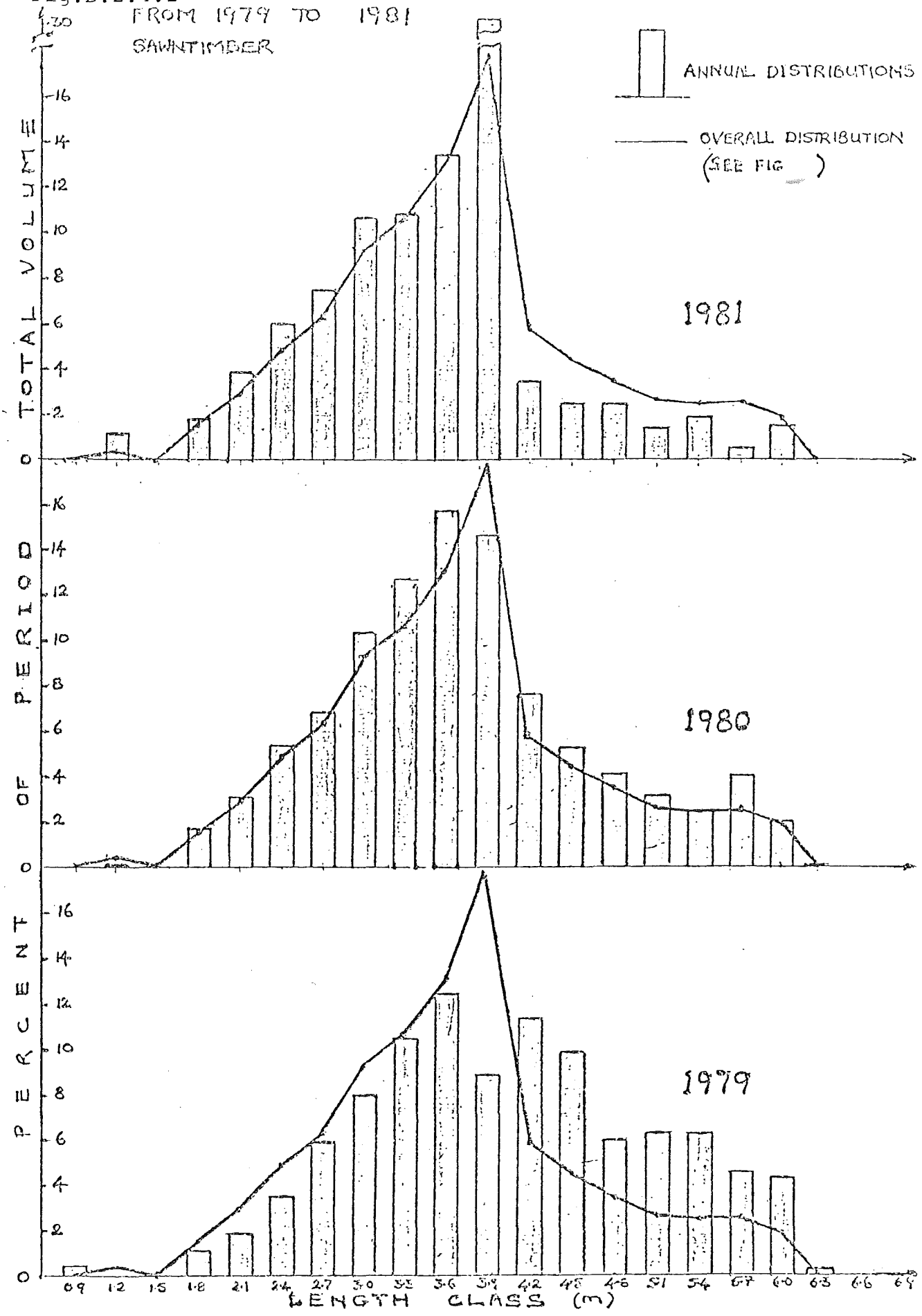


Fig. D.2.4.3 Sawntimber

VARIATION IN PROPORTIONS OF LENGTH CLASSES BEING SOLD; AS A MOVING AVERAGE (OVER THREE MONTHS) OF THE PERCENTAGE OF TOTAL PIECES PER MONTH; - FOR THE THREE YEARS ENDING DECEMBER 1981

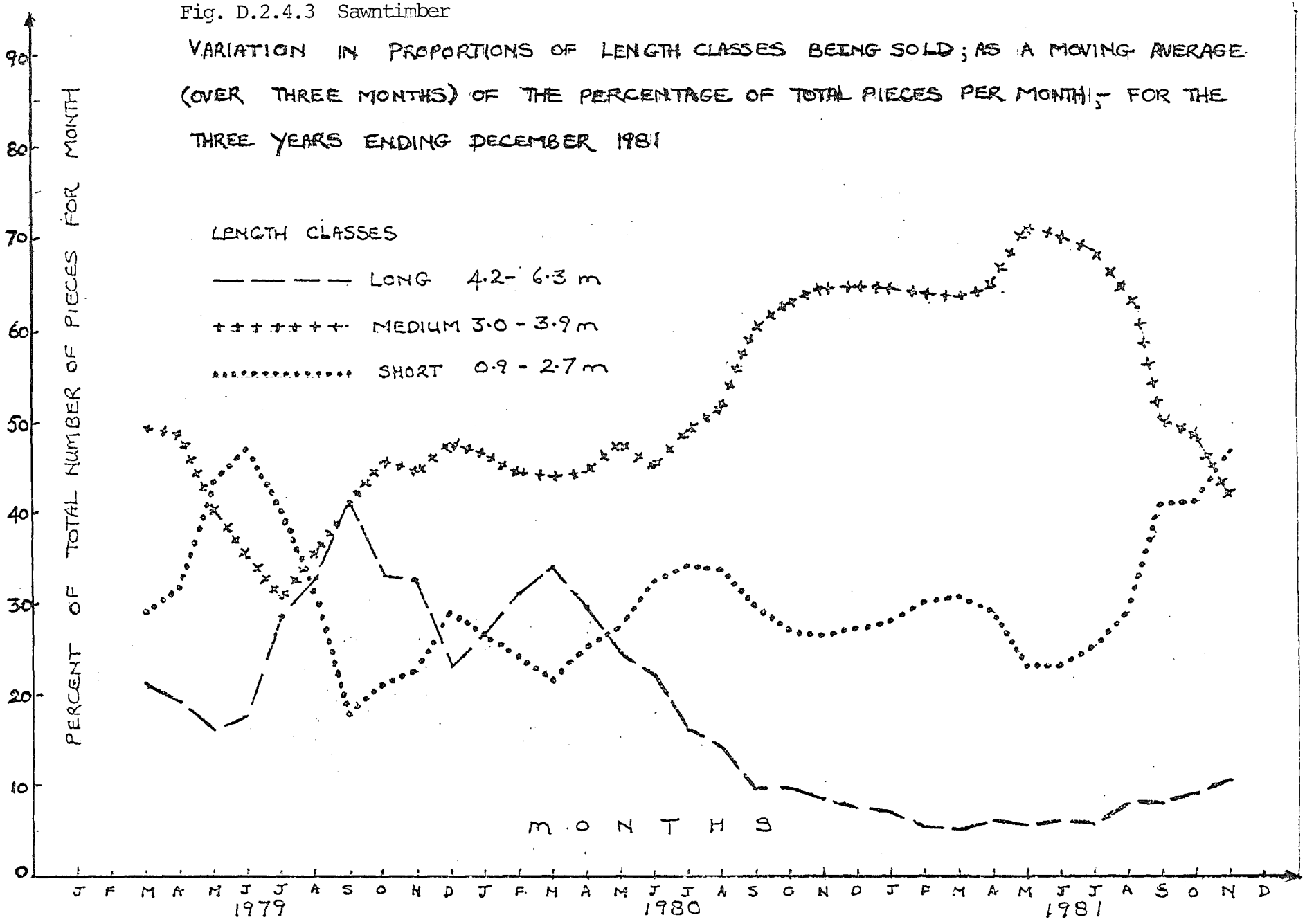
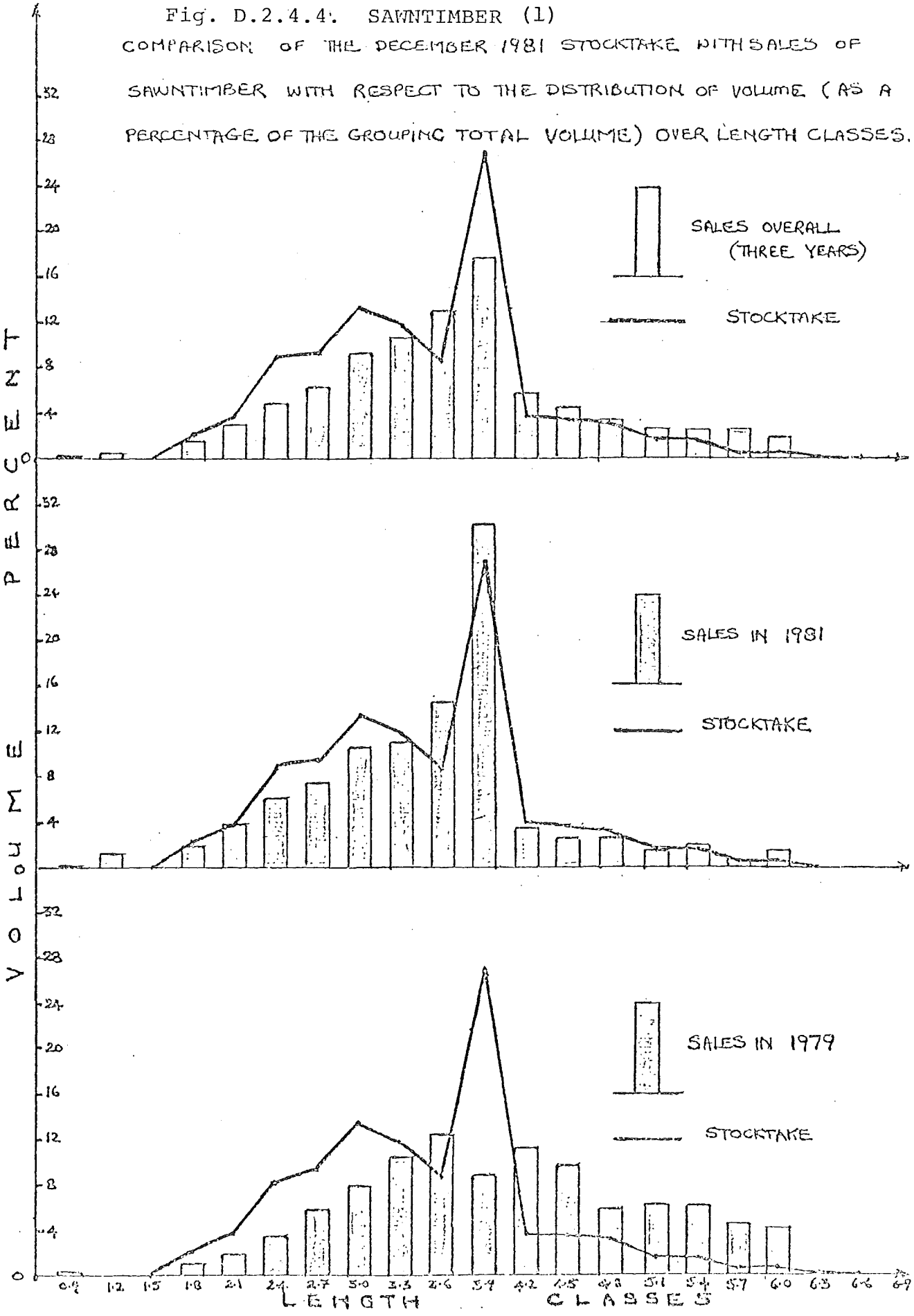


Fig. D.2.4.4. SAWNTIMBER (1)
COMPARISON OF THE DECEMBER 1981 STOCKTAKE WITH SALES OF SAWNTIMBER WITH RESPECT TO THE DISTRIBUTION OF VOLUME (AS A PERCENTAGE OF THE GROUPING TOTAL VOLUME) OVER LENGTH CLASSES.



(1) Source: Table D.2.4.1

There is a significant depletion of 3.6mand 3.3 m lengths in stock when this is compared with any of the sales distributions over lengths.

D.2.5 The interaction of dimension and length.

In Figure (D.2.5.1) the three year distribution of volume over length class is shown for the three top selling dimensions. They clearly illustrate the association of larger lengths with larger dimensions even though the "truncation effect" has forced these distributions to a common mode and restricted the expression, through sales, of the demand for longer lengths.

In 1979 the availability of longer lengths was less constrained (see Fig. (D.2.4.4.) and the modal length for larger dimensions tended to be higher while their volume over length class distributions were more biased toward the longer lengths. (See Appendix table A.D.2.5.2.)

D.3 POSTS AND POLES,

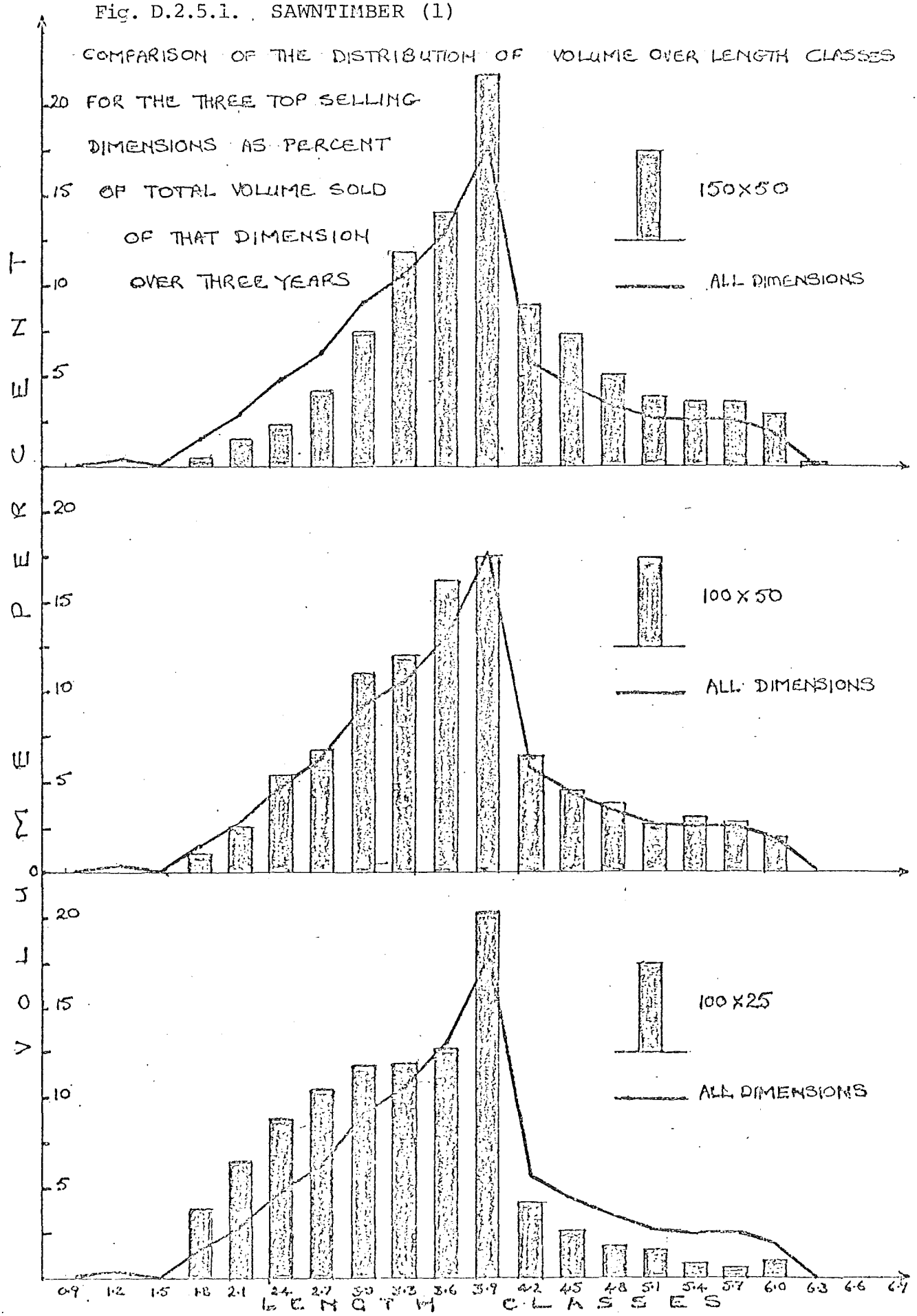
All summary tables appearing in this section are drawn from appendix tables (A.D.3.1 to A.D.3.8).

D.3.1 The top selling product categories (piece sizes).

The top ten post and pole sizes have been chosen on the basis of their contribution to the total number of pieces sold over the three year period. Their ranking and relative proportions are given in table (D.3.1.1.) The contribution of this same ten to the total volume of sales, has also been calculated (since this measure relates more closely to the resource availability) and the results are given in Table (D.3.1.2.) for comparison.

Fig. D.2.5.1. SAWNTIMBER (1)

COMPARISON OF THE DISTRIBUTION OF VOLUME OVER LENGTH CLASSES FOR THE THREE TOP SELLING DIMENSIONS AS PERCENT OF TOTAL VOLUME SOLD OF THAT DIMENSION OVER THREE YEARS



(1) Source Appendix table (A.D.2.5.1.)

TABLE D.3.1.1.

POSTS & POLES: PROPORTION OF SALES AND STOCK BY NUMBER OF PIECES FOR THE TOP TEN SIZES

SIZES LENGTH (m) X DIAMETER (cm)	YEAR 1979		YEAR 1980		YEAR 1981		OVERALL (3 YRS)		STOCKTAKE	
	Pcs	Pcs(%)	Pcs	Pcs(%)	Pcs	Pcs(%)	Pcs	Pcs(%)	Pcs	Pcs(%)
2 x 7	1901	9.680	50482	42.168	24903	33.794	77286	36.277	10792	19.550
2 x 10	1690	8.605	36275	30.301	14885	20.199	52850	24.807	11438	20.720
3 x 10	2413	12.287	6850	5.722	10298	13.975	19561	9.182	6081	11.016
3 x 13	3814	19.421	4820	4.026	5981	8.116	14615	6.860	3797	6.878
2 x 13	2140	10.897	5086	4.248	3660	4.967	10886	5.110	4602	8.337
2 x 16	389	1.981	3723	3.110	1740	2.361	5852	2.747	2931	5.309
3.5 x 16	372	1.894	1152	0.962	3464	4.701	4988	2.341	50	0.091
3 x 16	825	4.201	1681	1.404	2197	2.981	4703	2.208	1516	2.746
3.5 x 13	576	2.933	619	0.517	499	0.677	1694	0.795	27	0.049
2.7 x 16	0	0.0	939	0.784	447	0.607	1386	0.651	2046	3.706
OTHERS	5519	28.102	8088	6.756	5617	7.622	19224	9.023	11923	21.598
TOTAL	19639	100.000	119715	100.000	73691	100.000	213045	100.000	55203	100.000
½ and ¼ ROUNDS	15	0.076	14180	11.845	7833	10.630	22028	10.340	1610	2.917

TABLE D.3.1.2

POSTS & POLES: PROPORTION OF SALES AND STOCK BY VOLUME[2] FOR THE TOP TEN SIZES

SIZE	Y E A R						OVERALL (3 YRS)		STOCKTAKE	
LENGTH (m)	1 9 7 9		1 9 8 0		1 9 8 1		V O L U M E		V O L U M E	
X DIAMETER (cm)	Vol.(m^3)	Vol.(%)	Vol.(m^3)	Vol.(%)	Vol.(m^3)	Vol.(%)	(m^3)	(%)	(m^3)	(%)
2 x 7	18.630	1.883	494.724	16.798	244.049	10.577	757.403	12.135	105.762	4.652
2 x 10	31.603	3.195	678.343	23.033	278.350	12.063	988.295	15.834	213.891	9.409
3 x 10	73.597	7.440	208.925	7.094	314.089	13.612	596.611	9.558	185.471	0.420
3 x 13	185.742	18.777	234.734	7.970	291.275	12.623	711.751	11.403	184.914	0.502
2 x 13	65.056	6.577	154.614	5.250	111.264	4.822	330.934	5.302	139.901	6.154
2 x 16	17.505	1.770	167.535	5.689	78.300	3.393	263.340	4.219	131.895	5.802
3.5 x 16	31.694	3.204	98.150	3.333	295.133	12.791	424.978	6.809	4.260	0.187
3 x 16	58.658	5.930	119.519	4.058	156.207	6.770	334.383	5.357	107.788	4.741
3.5 x 13	33.754	3.412	36.273	1.232	29.241	1.267	99.268	1.590	1.582	0.070
2.7 x 16	0.0	0.0	59.157	2.009	28.161	1.220	87.318	1.399	128.898	5.670
OTHER	472.953	47.812	693.104	23.534	481.351	20.861	1647.407	26.394	1068.932	47.021
TOTAL	989.192[1]	100.000	2945.078[1]	100.000	2307.420[1]	100.000	6241.688[4]	100.000	2273.294[3]	100.000

(1) These totals have been estimated by assuming that the mean volume per piece in the "Others" category, remains constant at the value it has over all three years, (i.e. 1647.407 m^3/19224 pcs = 0.0857 m^3/pc).

(2) This volume is derived from Table (D.3.1.1) using the F.P.C. Metric Post & Pole Volume table (see AppendixA.D.3 9.)

(3) This total does not include 853.005 cubic metres of Consigned/Agents Stock, rejected and written off stock.

(4) This total is derived from Appendix Table (A.D.3.1) , using the volume table mentioned in note (2).

Note that although ranking is considerably altered (in table D.3.1.2.) , no piece size moves by more than two places. Most significantly the "others" category goes from 9.0% (by number of pieces) to 26.4% by volume which suggests that the position of lower ranked products might radically change if the selection of a top ten were based on volume.

The data of table (D.3.1.1) are represented graphically in Fig. (D.3.1.1.). No overall falling or rising trends are discernible,(1) in contrast to the sawntimber sales, but the whole pattern seems to be dominated by a disproportionate response of the sizes 2 m x 7 cm and 2 m x 10 cm to the increased total sales levels of 1980. All other sizes show a corresponding inverse correlation of sales per cent with total sales, with the notable exception of 2 m x 16 cm.

D.3.2 Comparison of stocks and sales.

Fig. (D.3.2.1) compares the overall post and poles sales and stock in three ways. Graph (A) shows the proportions by number of pieces for the top ten products. Graph (B) gives the distribution over standard lengths and graph (C) the distribution over standard diameter classes.

If the overall proportions are accepted as the best indication of appropriate relative stock levels, the post and pole yard appears to have been understocked with respect to 2 m x 7 cm posts in December 1981. Any substantial increase in sales during 1982 would have aggravated this situation (see section D.3.1). Stocks of 16 cm and 19 cm diameter material were relatively high but could be used to offset the lack of 2 m x 7 cm pieces by resawing to half rounds. Lengths of 2.7 m were over-represented in stock but there again, could be easily docked to lower length classes as required.

(1) See also Appendix table A.D. 3.8.)

Fig. D.3.1.1. POSTS AND POLES

PROPORTION OF SALES BY NUMBER OF PIECES

FOR THE TOP TEN SIZES OVER THREE YEARS

AS A PERCENTAGE OF THE OVERALL TOTAL

AND THE TOTAL IN EACH YEAR

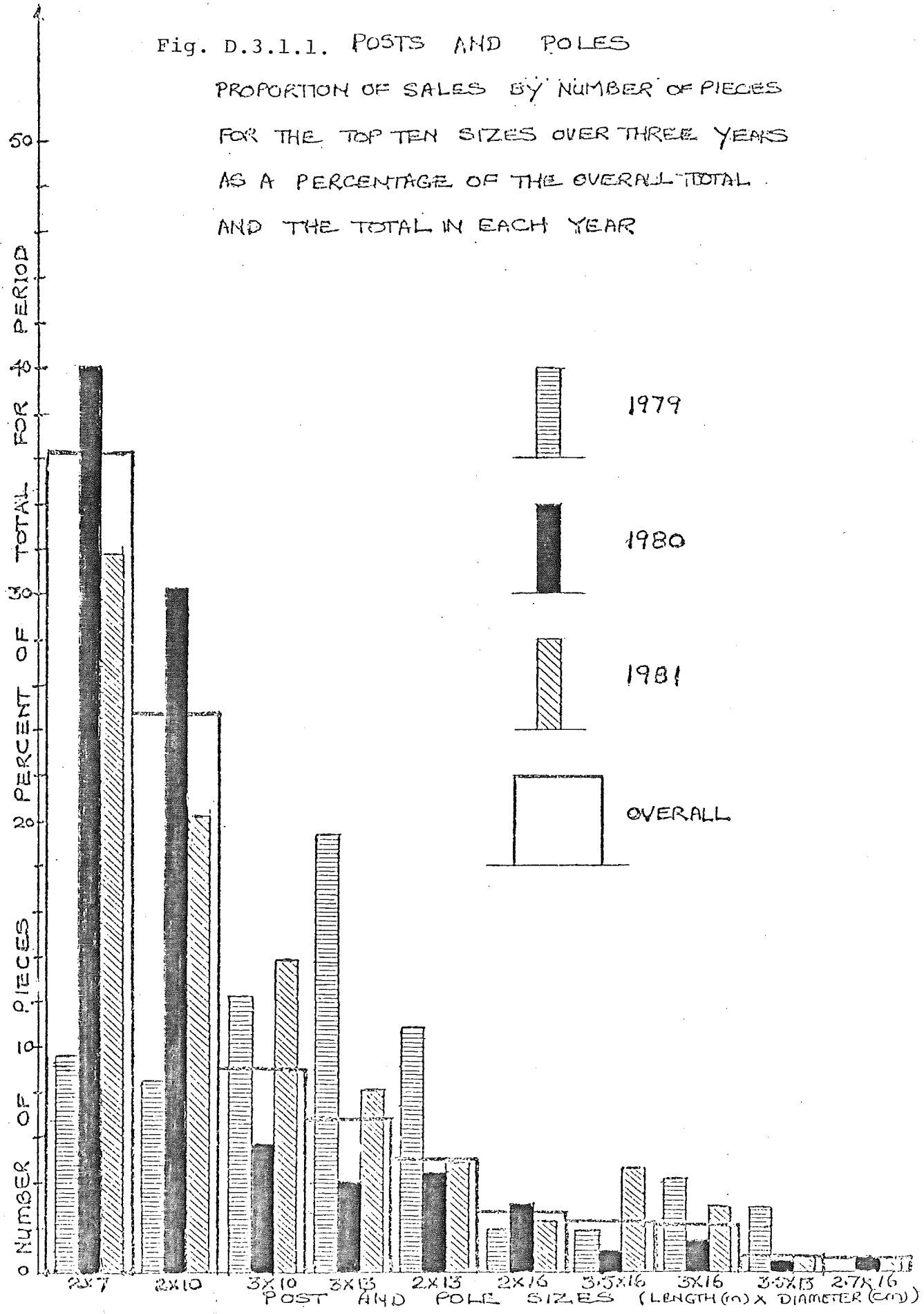
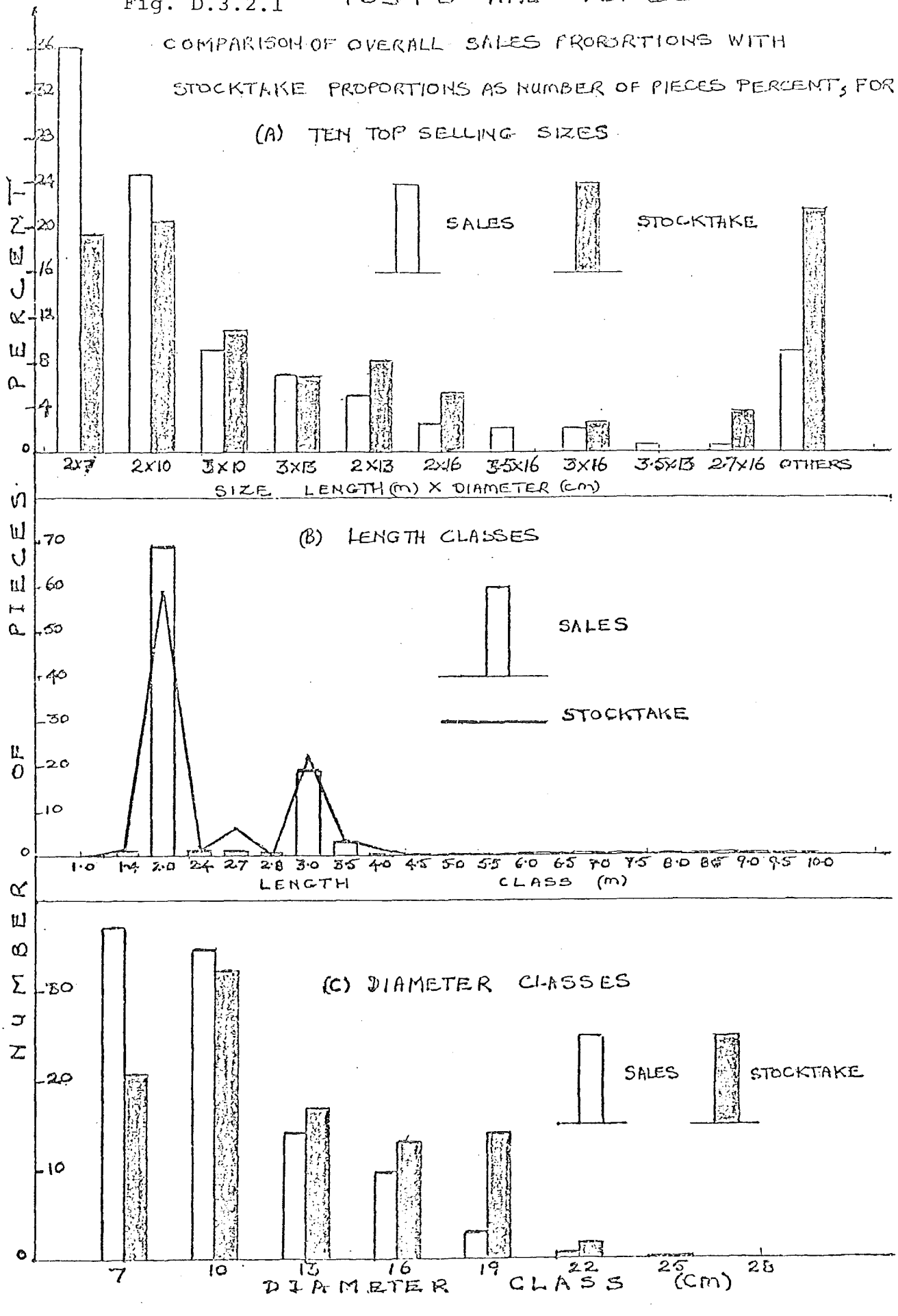


Fig. D.3.2.1 POSTS AND POLES

COMPARISON OF OVERALL SALES PROPORTIONS WITH STOCKTAKE PROPORTIONS AS NUMBER OF PIECES PERCENTS FOR:



E. DISCUSSION

To conduct a study of demand by way of sales and stock data is to see the market through a rather narrow and obscured, but strategically placed window. Stocks and sales are of course influenced by both demand and supply, but it is not always obvious which side is influencing what aspect of the picture, and to what degree.

The window is "narrow and obscure" because there are many factors interacting beyond the timberyard and sales office whose effect on the "view" is seen only in aggregate. It is strategically placed however because all these influences are brought together at this point.

Demand side factors which could affect the relativity of product sales include, cyclic fluctuations in the national and world economy acting on the timber using industries, seasonal variations in building activity,and local building practices and their adjustment to *P. caribaea* as a relatively new material. There is also consumer willingness (or resistence) to accept substitutes for products in short supply and consumer responsiveness to quality and supportive services. For instance, development by vertical integration into retailing would imply a different mix of clients with different demands from those served by the F.P.C.'s present wholesaling orientation.

On the supply side there is firstly the physical resource; e.g. log diameter and defect free length and its handling (bucking strategy, sawing, grading, seasoning and inventories). From the resource base there may then follow a marketing effort; the extent to which management attempts to supply, actively seeks and/or attempts to direct, consumer preferences.

Differential pricing influences relative sales of products from both the demand and supply sides. The F.P.C. prices all sawntimber on a straight volume basis but there are differential rates for Government, wholesale and retail sales and timber grades and treatment. Since the differential is not directly among dimensions or lengths, it is unlikely to alter conclusions reached here concerning relative demands.

The analysis of demand and supply is also somewhat obscured by the relatively recent appearance of the Drasa sawmill as a timber producer on the local scene, with its own initial timber requirements and changing effects of scale.

E.1 SAWNTIMBER

Quantitative proportions have been assigned to the ten major dimensions but considering their variability and trends revealed in Figs. (D.2.2.1) & (D.2.4.3), no particular year or even the overall ranking can be regarded as the best "target" for future production. The proportions may be indicative but are not as important as an understanding of the impact of factors which are responsible for the unstable pattern of product relativities.

From Fig. (D.2.4.3) it appears that the sales pattern has moved abruptly from a state of initial stochastic equilibrium, around the middle of 1980, to a state of active adjustment which is still in process at the end of 1981. The initial state was one of a competitive market stiuation when the local consumers were of greatest importance to the Pine Commission and hence it sought to supply their requirements first (FPC Annual Report 1979). In 1980 export became a significant feature for the first time. At the peak of log production, 170 loggers were involved, mostly landowner teams for whom there was a minimum of formal training before

becoming operational, (FPC Annual Report 1980). Routine bucking to four and eight metre lengths was introduced with immediate and far reaching consequences for the local markets. "Demanding specifications for overseas roundwood markets resulted in a degree of waste in the forest only part of which was disposed of to an expanded firewood market." (op.cit).

At the same time logging operations had moved into younger aged stands thereby supplying logs of smaller diameter and shorter defect-free length to the sawmill. There was also a gradual reduction in the volume of the native medium hardwoods handled by the timber yard during 1980 with an associated fall off in sales of larger diemnsions and, consequently, longer lengths, through the interaction of dimension and length described in section D.2.5.

In Fig.(D.2.4.3) it can be seen that the response of lengths sold,to the changing log supply was fairly rapid. The proportion of longer lengths fell steadily and sharply from March to September 1980 while sales of medium lengths rose abruptly between June and October. Sawn pine demand exceeded availability in 1980 (F.P.C. Annual Report 1980) and old stocks of longer pieces would soon have been exhausted, thus supply soon affected sales.

The effect on dimension sales can be followed in Fig. (D.2.2.1.). The response was slower here, presumably due to a broader tolerance in demand for specific lengths than for specific dimensions. This relative inertia also helps explain why the proportions of dimensions in stock coincide with sales proportions in 1980 while proportions of lengths in stock,coincide with the 1981 sales.

The depletion in stocks of 3.6 m and 3.3 m lengths

(see Fig. (D.2.4.4.) can be seen as a stage in the adjustment of stocks to a new equilibrium distribution which will in the long run, if the imposed supply situation continues, look something like the sales distribution of lengths in 1981. It would appear that the demand for lengths longer than 4.0 m, being frustrated by the supply situation, has been transferred to the next lowest length classes, particularly 3.9 m. This has left fewer 3.9 m pieces available for docking to all shorter lengths, but stocks of 3.6 m suffer most since they are closest to the most desired length, and must also absorb an increased demand because of that.

Stock and demand distributions will tend to coincide in the long run because consumers cannot buy what is not made available while the suppliers will tend to stop producing commodities that do not sell.

Evidence that the lower peak in the distribution of volume over lengths in stock is actually moving toward lower length classes, can be found, again, in Fig. (D.2.4.3.) where the convergence of the short length and medium length curves indicates an increasing proportion of short lengths being sold, during late 1981.

The length/dimension interaction demonstrated in section D.2.5, does not offer a complete explanation for the increasing proportion of smaller dimensions sold (e.g. 100 x 25 mm, 75 x 25 mm and 75 x 10 mm) since these products are also increasing their sales volume in absolute terms. This trend may reflect an increasing appreciation of Caribaea's utility when treated, as dressed flooring or weatherboards and/or growing confidence of the Drasa sawyers in producing these smaller dimensions accurately.

There is good evidence, see Fig. (D.2.4.2.) that the local market when relatively unconstrained with respect to the

supply of large dimensions and longer lengths will in fact consume a much higher proportion of that material. The Woodbridge report (1981) however, makes the following observation, of timber utilisation in Fiji.

"From a technical point of view the sizes used are unnecessarily large and the quality too high in relation to structural needs. However, aesthetic considerations may be more important in some circumstances."
(i.e. The market may be capable, to some degree, of long-term adjustment.)

E.2. POSTS AND POLES

The overall proportions arrived at for the post and pole sizes may be of greater use to inventory strategies than those for sawntimber since the sales appear less subjected to a restricted supply situation. Variability from year to year is still large making prediction imprecise, but one useful relationship observed is the tendency for the two top selling products (2 m x 7 cm and 2 m x 10 cm) to form a significantly larger proportion of sales as total sales increase. These two products will probably therefore make the greatest contribution to future expansion of post and pole demand.

The analysis has revealed no serious inadequacy in the present system of directing roundwood supplies in to different post and pole categories. It might serve however, to improve the "fine tuning" of inventory enabling a more efficient allocation of lengths by bucking, and diameter by selection of stands for pole supply, in the forest. For example, a greater number of 7 cm posts could have been stocked at the end of 1981, by comparison with their overall proportion of sales, and selection on stump would avoid costly resawing of large diameter poles to half rounds,

(providing there is only a limited specific demand for ¼ and ½ rounds).

Apart from allowing economies of scale in production runs, accurate stocking saves space in the yard for the faster moving products.

E.3. SAWNTIMBER AND POST AND POLES COMPARED

The stock levels of posts and poles by volume are only slightly more than the mean annual volume sold during the three years (see table D.3.1.2) i.e. 2080 m^3 an^{-1} while the stock volume of sawntimber was almost twice the mean annual sales volume (i.e. 730 m^3 an^{-1}) (table D.2.1.1)

While the general economic recession may have been largely responsible for reduced sales in 1981, sawntimber was more seriously affected than post and poles, and this might be partly explained by the relative inability of sawntimber stocks to supply the longer lengths and bigger dimensions that the market requires. Quality was also a problem for the sawn product. During a sampling assessment at the Drasa mill stocks conducted in February 1981, a relatively high proportion of sawing degrade attributed to inadequate mill equipment, was observed by the author.(1) (The results of that survey are not detailed in this report). No doubt the situation will have improved with the commissioning of the new mill plant in 1982. (See Prints B.1.1 to B.1.3).

The change of Marketing orientation from Domestic to export has not affected Post and Pole Sales as it did those of Sawntimber. The Post and Pole specifications of trading partners no doubt are more similar to Fiji's own, than their requirements for Sawlog and timber lengths. Perhaps also, a disproportionate share (on the basis of total volumes)

(1) See print (B.5.1).

of relatively scarce, defect free, 8.0 m sawlog lengths have been assigned to export rather than local consumption.

F. CONCLUSION

The Drasa Mill sawntimber sales records show clearly a change in emphasis by the F.P.C. from Domestic to Export marketing in the middle of 1980.

Log input was restricted to four metre and a limited amount of 8 metre lengths. At the same time supplies of large dimension and long length native timbers for resale began to dwindle. This caused a shift away from (an apparent) state of apparent equilibrium between demand and supply (as reflected in sales and stock respectively) into a period of transition from high to lower sales proportions of long lengths and big dimensions. The transition to a new equilibrium was not complete at the end of 1981.

Sales proportions which have been tabulated for the ten top selling products are of limited predictive use on their own due to their underlying state of flux, and other significant individual trends. The 100 x 50 mm framing dimension has for instance a tendency to increase its share of sales as total sales volume increases. Sales of some smaller dimensions (e.g. 100 x 25 mm and 75 x 25 mm) are increasing both proportionately and absolutely due perhaps, to factors such as changing consumer perception of *P. caribaea's* uses.

The demand for longer lengths and (by association) larger dimensions, exceeds the current supply but the position of local marketing will improve as stands of older age classes become available for milling. If the Pine Commission could refine its on-skid bucking strategies to provide the Drasa mill with logs of length intermediate to 8 and 4 metres as well as these standard lengths, it would thereby gain the greatest possible advantage from its local markets while providing a better service. An initial target distribution

of volume over lengths could follow a symmetric Weibull function with mean at 3.9 m or 4.2 m (a composite of the 1979 least restrained distribution and the 1980, biggest total annual volume distribution). This would require sorting of export and domestic logs, on-skid.

The top ten selling post and pole products by number of pieces have also been tabulated and although proportions vary widely the ranking is more stable as total sales increase. The two top piece sizes (2 m x 7 cm and 2 m x 10 cm) volumes of sales are positively correlated with total sales. There are no other obvious underlying trends which could mean that these overall proportions will be more useful indicators than those for sawntimber.

The most appropriate distribution of volume over product categories in both cases, will be that from a period which most closely resembles the forward planning period, in terms of its supply situation and expected total sales level.

The utility of studies such as this will increase as accumulating sales data (now routinely recorded in the F.P.C. computer based information system) is more accessible and thus, more readily related to detailed log supply information and knowledge of local timber usage.

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WOODBRIDGE REED & ASSOCIATES 1981 Export Market potential for Fijian Timber - situation assessment and marketing strategy. Commissioned by the export market development division of the Commonwealth Secretariat financed by the Commonwealth Fund for Technical Co-operation.

APPENDICES

APPENDIX A.B.5.1

SPECIFICATION OF METRIC DIMENSIONS FOR TIMBER IN FIJI

(prepared by the Timber Industry Sub Committee of the Metrication Board and issued by the Department of Forestry.)

FOREWORD

The Building and Construction Committee of the Metrication Board has agreed that metric timber sizes in Fiji will follow the sizes which have been adopted in New Zealand under NZS 3601 : 1973 "Metric Dimensions for Timber". This is reasonable since local authorities have proposed the adoption of the New Zealand Model Building By-Laws (NZS 1900 series) and these metric sizes will be written into standards such as the "NZ Light Timber Framing Code" and the "Timber Engineering Code".

METRIC DIMENSIONS FOR TIMBER

1. Scope

1.1 This specification lists the preferred range of lengths and cross-section dimensions for dry dressed and green gauged timber in metric measure.

2. Definitions

2.1 CALL DIMENSIONS are the dimensions by which timber is referred to in commercial transactions. The actual dimensions of timber will differ from the call dimensions according to its condition, for example, green or dry, gauged or dressed.

2.2 DRY TIMBER is timber with a moisture content of 17 percent or below.

2.3 DRY DRESSED TIMBER is dry timber as defined above, accurately machined to certain dimensional limits.

2.4 FIBRE SATURATION POINT refers to the moisture content below which shrinkage commences and is normally between 25 and 30 percent depending on species. For practical purposes the value of 28 percent can be used.

2.5 GREEN TIMBER refers to timber with a moisture content equal to or higher than 25 percent.

2.6 GREEN GAUGED TIMBER refers to green timber where dimensional accuracy is required. Dimensional accuracy can be achieved by accurate sawing or by subsequent passage through a planing machine. Structural design requirements are based on the green gauged dimensions.

2. MOISTURE CONTENT refers to the amount of moisture in timber expressed as a percentage of its oven-dry weight.

Appendix A.B.5.1 (Contd.)

3. Preferred range of timber lengths

3.1 The preferred range of timber lengths shall extend from 1.8 m to 6.0 m in increments of 0.3 m as shown in Table 1.

3.2 There shall be no negative tolerance on lengths. Positive tolerance shall be permitted.

Table 1 PREFERRED RANGE OF LENGTHS FOR SAWN TIMBER

(metres)

1.8	3.3	4.8
2.1	3.6	5.1
2.4	3.9	5.4
2.7	4.2	5.7
3.0	4.5	6.0

4. Preferred range of call sizes for timber

4.1 The preferred range of call sizes for timber shall be as shown in Table 2.

4.2 Sizes other than those shown in Table 2 may be agreed to between supplier and purchaser.

Table 2 PREFERRED RANGE OF CALL SIZES FOR TIMBER

(millimetres)

Call dimensions of thickness	Call dimensions of width								
	50	75	100	125	150	200	225	250	300
15	x	x	x	x	x				
25	x	x	x	x	x	x	x	x	x
30			x		x				
40	x	x	x	x	x	x	x	x	x
50	x	x	x	x	x	x	x	x	x
75			x	x	x	x	x	x	x
100			x	x	x	x	x	x	x

Appendix A.B.5.1 (Contd.)

5. Dimensions of dry dressed and green gauged timber

5.1 The finished dimensions for dry dressed and green gauged timber corresponding to the call dimensions in Table 2 shall be as shown in the second and third columns respectively of Table 3, provided that other dimensions may be agreed between supplier and purchaser.

5. Negative tolerance shall not be permitted for either dry dressed or green gauged dimensions. Positive tolerance of 1.0 mm shall be permitted on dry dressed dimensions and positive tolerance of 2.0 mm shall be permitted on green gauged dimensions.

6. Shrinkage

6.1 As timber dries below the fibre saturation point, shrinkage across the grain occurs and there is a reduction in cross-sectional area.

6.2 Dressed dimensions shown in the second column of Table 3 apply only to timber with a moisture content between 14 percent and 17 percent and therefore the appropriate calculation must be made to determine the sawn dimensions of timber to be used at any other moisture content below the fibre saturation point, (28%). The dimensions in Table 3 have been based on an average unit shrinkage for all species of 0.3%; i.e. for every one percent reductions in moisture content below fibre saturation point, a reduction in dimension of 0.3% has been applied to allow for shrinkage. For species with high shrinkage rates (Kaudamu, Laubu, Sacau, Rosarosa and Yasiyasi) unit shrinkage of 0.6% should be used when the end use of the timber is to be in the dry dressed condition.

7. Dimensions of green sawn timber

7.1 Timber to be sold as green shall be sawn so that if accurately gauged it would have minimum dimensions as listed in the third column of Table 3. Positive tolerance of 2 mm above the call dimension is permitted on green sawn timber. As a guide to producers, the green sawn dimensions considered necessary to yield the dry dressed and green gauged dimensions are given. In determining these green sawn dimensions a combined shrinkage and dressing allowance has been made. This allowance increases from 5 mm for the smaller dimensions through to 15 mm for the larger dimensions.

8. Dimensions of dry rough sawn timber

8.1 The dimensions of timber to be sold in the seasoned rough sawn condition shall be a minimum of 4 mm above the dry dressed dimensions listed in Table 3 to allow for dressing. Other dressing allowance may be agreed to between the supplier and the purchaser.

Appendix A.B.5.1 (Contd.)

Table 3

Finished Dimensions for Dry Dressed Timber and Green Gauged Timber with Suggested Green Sawn Dimensions also shown.

Call Dimension	Dry Dressed Dimension	Green Gauged Dimension	Suggested Green Sawn Dimension
15	12	-	17
25	20	-	25
30	25	-	30
40	35	37	40
50	45	47	51
75	65	68	72
100	90	94	98
125	115	120	125
150	140	146	151
200	185	193	198
225	210	220	225
250	235	245	250
300	285	295	300

APPENDIX A.B.5.2

STANDARD POST AND POLE SIZES AVAILABLE FROM THE F.P.C. AT DRASA

Post and Pole Size Chart

Custom sizes available by order

TOP DIAMETER —centimetres

1. Treatment 12 kg/m3

LENGTH — metres	7	10	13	16	19	22	25	28
1.4			●	●	●	●	●	
2.0	●	●	●	●	●	●	●	
2.8				●	●	●	●	
3.0		●	●	●	●	●	●	
3.5			●	●	●	●	●	
4.0			●	●	●	●	●	
4.5			●	●	●	●	●	

2. Treatment 18 kg/m3

LENGTH — metres	7	10	13	16	19	22	25	28
5.0			●	●	●	●	●	●
5.5			●	●	●	●	●	●
6.0			●	●	●	●	●	●
6.5			●	●	●	●	●	●
7.0			●	●	●	●	●	●

Select Your Tanalith Treatment

Treatment	Usage	Apprx. Lifespan
12 kg/m^3	In ground contact low risk-fence posts	30 years (Poles out of ground contact — last lifetime of building)
18 kg/m^3	In ground contact high risk-piles, power poles	40—50 years

APPENDIX A.B.5.3

GUIDELINES FOR THE PREPARATION OF *P. CARIBAEA* POLES (FORESTRY DEPT. FIJI) SECTION 3, SPECIFICATION.

3.1 The pole should be generally circular in cross section, with the least diameter at point of measurement not being less than 90% of the average of the maximum and minimum diameters at the same point.

3.2 The butt should be cut square to the axis of the pole. The top may be similarly cut, or, at the request of the customer may be angled, eg. 15° bevel

3.3 Lengths should be cut to a tolerance of plus or minus 75 mm (3"). No reduction in the minimum diameters specified for any purpose is permitted. *Upper diameter limits can be at the discretion of the purchaser.

3.4 Poles should be free of the following defects:

(i) decay
(ii) insect damage, except that limited Ambrosia beetle attack is permitted.
(iii) shakes
(iv) transverse fractures
(v) spiral grain of more than one turn in 6 m (20')

3.5 Knot defects should be restricted as follows:

Unsound Knots: not permitted within the critical strength zone Elsewhere diameter of individual knots not exceeding one-twentieth of the circumference of the pole.

Encased Knots: (25 mm (1") and over in diameter). Not located in the critical strength zone; elsewhere diameter of individual knots not exceeding one-tenth of the circumference of the pole, and aggregate diameter of knots in any 0.3 m (1') length of pole not exceeding one-fifth of the circumference of the pole.

Sound Intergrown Knots: (25mm (1") and over in diameter). Diameter of individual knots not exceeding one-tenth of the circumference of the pole, and aggregate diameter of knots in any 0.3 m (1') length of pole not exceeding one quarter of the circumference of the pole.

---

*The economics of pole production and treatment make it essential to avoid any unnecessary over dimensioning.

3.6 A pole may have single sweep provided that a straight line joining the edges of the poles at the butt and at the top is not distant from the surface of the pole by more than the maximum permissible deviation as listed for each pole length:-

Pole length		Max Deviation	
6m	(19'8")	75mm	(3")
7m	(23')	90mm	(3.5")
8m	(26'3")	105mm	(4.1")
9m	(29'6")	120mm	(4.7")
10m	(32'10")	135mm	(5.3")
12m	(39'4")	165mm	(6.5")
13m	(42'8")	180mm	(7.1")
14m	(45'11")	195mm	(7.7")

3.7 A pole may have double or reverse sweep provided that a straight line between the mid-points of the butt and the top does not at any intermediate point pass through the surface of the pole.

3.8 Pole hooks, cant hooks and other pointed tools capable of producing indentations more than [half inch (12 mm)] deep should not be used on the poles. No identations are permitted in the critical strength zone; elsewhere isolated indentations not exceeding [half inch (12 mm)] deep are permissible. Other forms of mechanical damage, providing they do not occur in the critical strength zone and do not extend for more than one tenth of the circumference are permitted, providing they do not exceed [half inch (12 mm)] in depth.

3.9 Mechanical peeling of poles is permitted if the machines used have narrow cutting knifes, properly adjusted which follow the natural contours of the pole, neatly trimming but not removing knot whorls. The diameter of any pole at any point under the bark should not be reduced by more than [one quarter inch (6 mm)] as a result of machine peeling. (This stipulation is necessary to avoid possible reductions in strength).

4-CONVERSION

4.1 Poles after felling should be promptly converted, extracted, peeled and anti-sapstain dipped. These operations must be completed within one week

APPENDIX A.C.1.1

STANDARD F.P.C. SAWNTIMBER INVOICE FORM

DETAILING A HYPOTHETICAL SALE

FIJI PINE COMMISSION
P.O. Box 521
LAUTOKA

CREDIT SALE

PURCHASER'S COPY

No 898

Supplied to :-

Controller of Govt. Supplies
Lautoka.

CUSTOMERS O/No.....

DATE..23.10.81....

Packet NO.	Size	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	T No. Pcs.	Lin Meters	CUBIC METERS	UNIT COST	$	c
					TREATED PINE # 1 Framing																		
G1615	100x50	8	5	8	5	10	10	12	29	5	4	11	1	8	4	11		131	505·8	2·529	200·0	505	80
					UNTTS. PINE #1 FR.																		
G1644	100x50	4	7	24	6	15	10	6	38	2	4	7			4	1		128	432·3	2·162	110·0	237	82
					TR. P #2 QR.																		
G1650	100x25	3	6	16	6	17	7	8	19	1	2	2	2		2	2		93	306·0	0765	187·0	146	06
		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		Lin. ft.	Sup. ft.	Sup. ft. (per 100)		
TOTAL																					5·456	883	68

PREPARED BY.....C.W. Storey.....

CHECKED BY.....C.W. Storey.....

TRUCK NO.....DRIVER.....

Leader Press, Lautoka

APPENDIX A.C.1.2

STANDARD F.P.C. POSTS AND POLES INVOICE FORM DETAILING A HYPOTHETICAL SALE

INVOICE

FIJI PINE COMMISSION

P.O. Box 521
LAUTOKA

Phone: 61511 (Head Office)
62977 (Drasa)

Date 2.10.81

Supplied to:

Controller of Govt. Supplies.
Lautoka.

№ 4861

Customer's Order No. _____ Sold by C.W. Morey Checked by C.W. Morey

DETAILS	F.P.C. CODE	QUANTITY	UNIT PRICE $	UNIT PRICE C	COST $	COST C
treated pine posts						
2m x 7		21	1	38	28	98
2m x 10		34	2	15	73	10
3.5m x 16		2	8	33	16	66

APPENDIX A.C.2.1.1

SAWNTIMBER PRICE LIST AS FROM 1.9.80 TO 31.12.81

(Price list updated during 1982).(1)

Supplied to	Product	Unit Price
Controller of Government Supplies	#1 Framing & dressing	$200 per m^3
C.O.G.S.	#2 Framing & dressing	$187 "
Wholesale	#1 Framing & dressing	$187 "
	#2 Framing & dressing	$176 "
Retail	#1 Framing & dressing	$216 "
	#2 Framing & dressing	$180 "
	Treated Shorts (sold in packets)	$50 per packet
	Boxing grade	$160 per m^3
	Untreated Pine	
	#1 Framing & dressing	$110 "
	#1 Dressing Special Cuts 100x10mm, 150x20mm and 75x15mm	$150 "
	Facecuts untreated	$40 per packet
	treated	$60 "

(1) N.B. There was also a previous update, 1 August 1979.

APPENDIX A.C.2.1.2

POST AND POLE PRICE LIST AS FROM 1.9.80 TO 31,12,81

(Price list updated during 1982.) (1)

effective 1-9-80

1. PINE POSTS AND POLE - 10.25 Kg/m^3 TREATMENT (TANALITH)

length - metres \ Width - cm	7	10	13	16	19	22	25	28
1.4			2.08	3.09	3.71	5.40	6.92	
2.0	1.36	2.15	2.87	4.17	5.94	7.86	11.18	
2.4				5.51	7.65	11.19	14.29	
2.8				6.58	9.11	13.28	16.88	
3.0		3.09	4.33	6.98	9.68	14.34	18.23	
3.5			5.80	8.33	11.48	17.10	21.66	
4.0				10.01	15.24	19.86	25.20	
4.5				12.88	17.44	22.78	26.80	

2. PINE POSTS AND POLE - 17.6 Kg/m^3 TREATMENT (TANALITH)

length - metres								
5.0				17.78	24.08	31.28	39.49	48.66
5.5				20.00	27.00	35.10	44.21	54.34
6.0				22.39	30.10	38.98	48.99	60.19
6.5				24.86	33.30	42.98	54.00	66.15
7.0				27.39	36.62	47.19	59.10	72.34
7.5				30.00	40.10	51.47	64.35	78.64
8.0				32.85	45.59	55.91	69.75	85.11
8.5				35.72	47.25	60.47	75.26	91.74
9.0				38.70	51.10	65.14	81.00	98.55
9.5				41.74	54.96	89.98	86.85	
10.0				45.00	59.10	74.81	92.81	112.50

(1) N.B. There was also a previous update 1 Aug. 1979.

TABLE A.D.2.1.2

SAWNTIMBER: DECEMBER 1981 STOCKTAKE: DISTRIBUTION OF NUMBER OF PIECES OVER LENGTH CLASSES BY TOP TEN DIMENSIONS WITH MARGIN TOTAL VOLUMES

LENGTH CLASS	D I M E N S I O N (mm)											TOTAL	
	100 x 50	150 x 50	100 x 25	75 x 50	50 x 25	75 x 25	150 x 25	100 x 75	150 x 75	200 x 50	OTHERS	NO. OF PCS	VOLUME (m^3)
1.8	1504	188	1293	622	0	598	257	61	1	0	41	4565	2.167
2.1	2331	375	1220	1066	2	914	300	132	14	1	44	6339	3.744
2.4	5043	519	2499	1716	2	1277	361	352	28	1	54	11852	8.195
2.7	4763	765	2074	1470	6	1212	437	540	82	7	48	11404	9.349
3.0	5293	1275	2599	2237	5	1513	367	991	90	25	72	14467	13.489
3.3	3989	1223	1535	1411	2	1173	549	884	164	31	51	11012	11.920
3.6	2958	843	589	795	3	779	197	661	113	32	35	7005	8.790
3.9	8364	2347	1604	2181	8	1656	451	1754	666	91	106	19231	27.055
4.2	1177	200	414	351	1	233	141	168	92	20	13	2810	3.921
4.5	696	281	205	162	0	183	137	237	132	19	22	2074	3.559
4.8	566	226	260	134	1	118	122	170	80	44	30	1755	3.185
5.1	375	95	34	36	1	83	53	85	40	18	11	832	1.664
5.4	131	87	137	40	0	75	43	149	61	19	10	752	1.615
5.7	79	25	21	12	0	7	4	83	2	6	13	252	0.651
6.0	47	47	14	6	0	8	0	15	10	32	33	212	0.734
6.3	0	0	0	0	0	0	0	0	0	4	1	5	0.027
6.6	0	0	0	0	0	0	0	0	0	2	0	2	0.009
6.9	0	2	0	0	0	0	0	0	0	0	0	2	0.007
TOTAL (PCS)	37316	8500	14498	12179	31	9829	3419	6282	1575	352	584	94569	-
TOTAL VOLUME (m^3)	595.105	218.081	106.879	140.270	0.129	56.795	40.647	166.421	68.675	15.105	16.415	-	1424.7105

TABLE A.D.2.2.1

SAWNTIMBER: MONTHLY PATTERN OF SALES: VOLUME AS PERCENT OF THE MONTH TOTAL FOR THE TOP TEN DIMENSIONS

MONTH	DIMENSION											TOTAL	n.l.[1]
	100 x 50	150 x 50	100 x 25	75 x 50	50 x 25	75 x 25	150 x 25	100 x 75	150 x 75	200 x 50	OTHERS		
	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	Vol.(%)	(m^3)	(m^3)
JAN. 1979	0.462	5.548	1.337	1.860	0.0	0.0	5.695	0.0	0.0	5.688	79.409	10.7068	5.201
MAR.[2]	29.333	39.992	2.535	22.553	0.0	0.0	1.799	1.353	0.0	0.0	2.456	8.3155	0.0
APRIL	42.428	17.521	7.823	17.790	0.0	0.755	5.751	0.0	0.0	0.0	7.932	9.6057	0.1710
MAY	19.834	22.599	2.992	3.137	41.244	0.206	7.501	0.977	0.0	0.0	1.510	36.3693	15.0000
JUNE	8.964	12.925	28.747	5.974	6.871	2.467	27.300	3.342	0.0	0.0	3.410	19.7926	6.3412
JULY	34.658	7.541	0.070	8.653	42.414	0.577	0.317	0.0	0.0	0.0	5.771	27.0027	9.5000
AUGUST	21.921	37.329	0.465	11.641	0.0	2.026	0.111	6.251	10.059	1.921	8.274	41.5350	0.2292
SEPT.	29.506	40.463	4.725	12.590	0.0	0.0	3.165	0.456	0.219	6.860	2.017	37.0393	1.7500
OCT.	6.781	42.711	0.190	6.967	0.0	0.0	0.0	8.030	8.255	17.355	9.711	65.2539	0.0
NOV.	11.561	45.078	18.987	1.667	0.0	0.0	1.407	0.0	0.545	12.555	8.200	24.1583	0.0
DEC.	16.566	51.411	1.493	5.166	13.570	0.0	3.125	0.0	0.0	0.0	8.668	49.4311	32.537
JAN. 1980	21.126	52.088	8.147	6.553	0.0	2.182	8.957	0.0	0.0	0.0	0.947	34.6778	2.4749
FEB.	10.102	38.027	0.0	1.687	0.0	0.046	6.014	0.525	0.414	21.272	21.912	34.2704	0.3168
MARCH	25.865	23.082	0.264	11.932	5.180	0.063	3.867	3.841	3.242	7.257	12.406	114.9223	1.0248
APRIL	33.157	18.085	7.464	4.972	0.0	0.0	10.251	6.272	0.786	9.351	9.661	97.4625	0.0
MAY	49.611	8.932	10.450	5.244	10.188	6.931	1.769	0.870	0.0	2.507	3.499	153.4350	17.824
JUNE	37.545	12.616	7.746	9.210	7.531	5.024	1.481	7.034	4.575	0.086	7.381	101.3999	15.596

.../

TABLE A.D.2.2.1 (Contd)

MONTH	DIMENSION											TOTAL	n.l.(1)
	100 x 50 Vol.(%)	150 x 50 Vol.(%)	100 x 25 Vol.(%)	75 x 50 Vol.(%)	50 x 25 Vol.(%)	75 x 25 Vol.(%)	150 x 25 Vol.(%)	100 x 75 Vol.(%)	150 x 75 Vol.(%)	200 x 50 Vol.(%)	OTHERS Vol.(%)	(m^3)	(m^3)
JULY	3.849	1.213	26.044	2.282	17.694	30.590	9.266	1.377	0.0	1.931	5.754	60.2814	10.8332
AUGUST	29.092	14.614	10.284	5.685	11.450	4.407	4.506	0.690	5.772	0.076	13.424	101.9167	19.9698
SEPT.	32.098	21.107	15.150	5.665	8.679	0.0	2.575	2.869	7.514	0.0	4.343	86.2816	7.4880
OCT.	22.188	19.966	2.660	20.721	10.362	0.458	4.225	2.087	4.884	0.0	12.449	80.9818	8.3910
NOV.	45.781	9.289	10.777	8.849	7.011	6.835	0.916	0.557	0.207	0.570	9.207	126.8486	8.893
DEC.	51.043	13.960	9.375	2.514	7.204	8.987	0.747	3.290	0.111	0.0	2.769	109.5663	7.8928
JAN. 1981	26.970	33.412	2.167	8.746	0.085	12.105	4.707	2.084	0.0	0.0	9.723	43.9536	0.0
FEB.	36.540	13.102	6.551	15.164	3.172	9.662	4.020	2.553	2.077	0.0	7.160	40.6324	0.0
MARCH	21.700	7.628	33.032	14.487	5.401	9.547	3.708	1.032	1.324	0.0	2.141	120.5793	10.5584
APRIL	13.534	1.683	34.669	36.752	0.0	0.049	6.441	3.164	0.0	0.0	3.708	36.6290	0.0
MAY	18.198	0.574	17.389	3.782	4.060	0.127	5.777	24.849	24.691	0.0	0.553	61.5796	0.0
JUNE	5.761	1.164	7.499	2.413	0.0	29.204	11.469	0.0	0.711	0.0	41.779	20.8829	0.0
JULY	0.608	3.823	35.054	0.672	4.098	30.066	9.671	0.285	0.0	0.0	15.723	47.3802	1.5
AUGUST	8.243	3.452	32.796	4.353	0.0	13.390	3.406	0.500	0.0	0.0	33.860	108.0057	0.0
SEPT.	23.138	22.394	22.548	16.504	0.0	10.507	2.781	0.689	0.620	0.0	0.819	102.2604	0.0
OCT.	15.399	7.401	53.093	4.747	13.304	2.880	0.151	0.076	0.0	0.0	2.949	71.2923	0.0
NOV.	37.844	0.598	21.085	10.797	6.749	1.508	5.903	8.646	0.182	0.0	6.688	22.2244	0.0
DEC.	23.247	14.014	26.824	11.567	0.136	0.099	16.927	2.410	2.939	0.0	1.835	54.4267	0.0
TOTAL (m^3)	593.011	368.908	318.826	188.117	143.519	130.803	93.325	64.816	57.716	48.867	183.195	2191.1022	
TOTAL (%)	27.065	16.837	14.551	8.585	6.550	5.970	4.259	2.958	2.634	2.230	8.361	100.000	

(1) This column records the volume for which no length was assigned to pieces.

(2) There were no sales in February 1979.

TABLE A.D.2.3.1

SAWNTIMBER: MONTHLY PATTERN OF SALES EXCLUDING INTERNAL SALES: VOLUME AS PERCENT OF THE MONTH TOTAL; BY DIMENSION

MONTH	D I M E N S I O N S											
	100 x 50 Vol.(%)	100 x 25 Vol.(%)	150 x 50 Vol.(%)	75 x 50 Vol.(%)	75 x 25 Vol.(%)	150 x 25 Vol.(%)	100 x 75 Vol.(%)	75 x 10 Vol.(%)	150 x 75 Vol.(%)	200 x 50 Vol.(%)	OTHERS Vol.(%)	TOTAL (m^3)
JANUARY '80	22.988	8.865	49.762	8.551	2.374	5.652	0.0	0.0	0.0	0.0	1.808	31.8688
FEBRUARY	8.783	0.0	37.294	1.649	0.052	6.787	0.593	0.0	0.467	23.633	20.742	30.3647
MARCH	30.822	0.288	25.026	12.846	0.069	4.035	4.184	0.0	3.532	7.837	11.360	105.4980
APRIL	33.165	7.353	18.117	4.980	0.0	10.270	6.283	0.0	0.787	9.367	9.678	97.2945
MAY	59.258	0.743	9.159	6.345	8.361	2.001	1.052	0.0	0.0	1.658	1.423	126.8115
JUNE	40.711	8.451	12.976	10.048	5.481	1.616	5.778	0.0	4.991	0.093	9.856	120.4419
JULY	4.102	32.276	0.197	1.876	44.674	12.103	1.843	0.0	0.0	0.351	2.378	41.0275
AUGUST	36.044	13.274	18.920	7.133	5.734	5.864	0.897	1.658	7.511	0.0	2.964	85.2410
SEPTEMBER	37.135	13.329	24.316	5.707	0.0	2.439	3.337	2.707	8.741	0.0	2.290	74.1747
OCTOBER	24.617	2.264	23.148	24.359	0.134	3.531	1.643	5.999	5.798	0.0	8.508	66.2100
NOVEMBER	50.490	10.117	10.035	9.798	7.445	2.485	0.628	2.693	0.0	0.643	7.664	112.4260
DECEMBER	63.086	7.526	4.061	3.107	11.108	0.924	4.066	0.0	0.137	0.0	5.986	88.6507
JANUARY '81	27.292	0.263	34.274	8.971	12.418	4.828	2.137	0.0	0.0	0.0	9.817	42.8481
FEBRUARY	41.704	6.079	12.788	12.541	13.056	3.349	3.449	0.0	1.190	0.0	5.844	30.0688
MARCH	23.005	34.791	8.092	4.784	10.115	3.521	1.095	0.985	1.405	0.0	2.208	113.6617
APRIL	3.595	35.294	1.713	36.358	0.0	6.044	3.221	0.0	0.0	0.0	3.775	35.9803
MAY	18.850	19.372	0.0	3.665	0.0	3.436	27.548	0.0	27.002	0.0	0.125	55.1964
JUNE	4.837	6.907	0.0	1.785	30.722	11.878	0.0	16.321	0.0	0.0	27.550	19.7849
JULY	0.762	27.506	4.678	0.759	37.194	8.815	0.0	7.960	0.0	0.0	12.277	37.8054
AUGUST	9.590	22.450	4.016	5.065	15.580	3.764	0.582	26.203	0.0	0.0	12.750	92.8287
SEPTEMBER	26.083	13.681	26.678	19.514	12.159	1.777	0.0	0.0	0.0	0.0	0.107	85.8417
OCTOBER	16.208	51.984	7.887	4.930	2.659	0.161	0.081	0.0	0.0	0.0	16.090	66.9007
NOVEMBER	30.946	20.990	0.598	9.071	0.546	2.522	7.441	0.0	2.522	0.0	25.365	22.2244
DECEMBER	23.435	27.144	14.181	11.640	0.100	16.093	2.439	0.0	2.974	0.0	1.994	53.7856
TOTAL (m^3)	516.934	251.386	233.150	155.960	127.392	69.336	51.542	42.224	40.757	27.528	117.640	1633.8501
TOTAL (%)	31.639	15.386	14.270	9.546	7.797	4.244	3.155	2.584	2.495	1.685	7.200	100.000

Fig. A.D.2.3.2

VARIATION OF SALES (EXCLUDING INTERNAL) AS PERCENTAGE OF SAWNTIMBER SOLD FOR THE TOP THREE DIMENSIONS OVER THE TWO YEARS ENDING DEC 1981

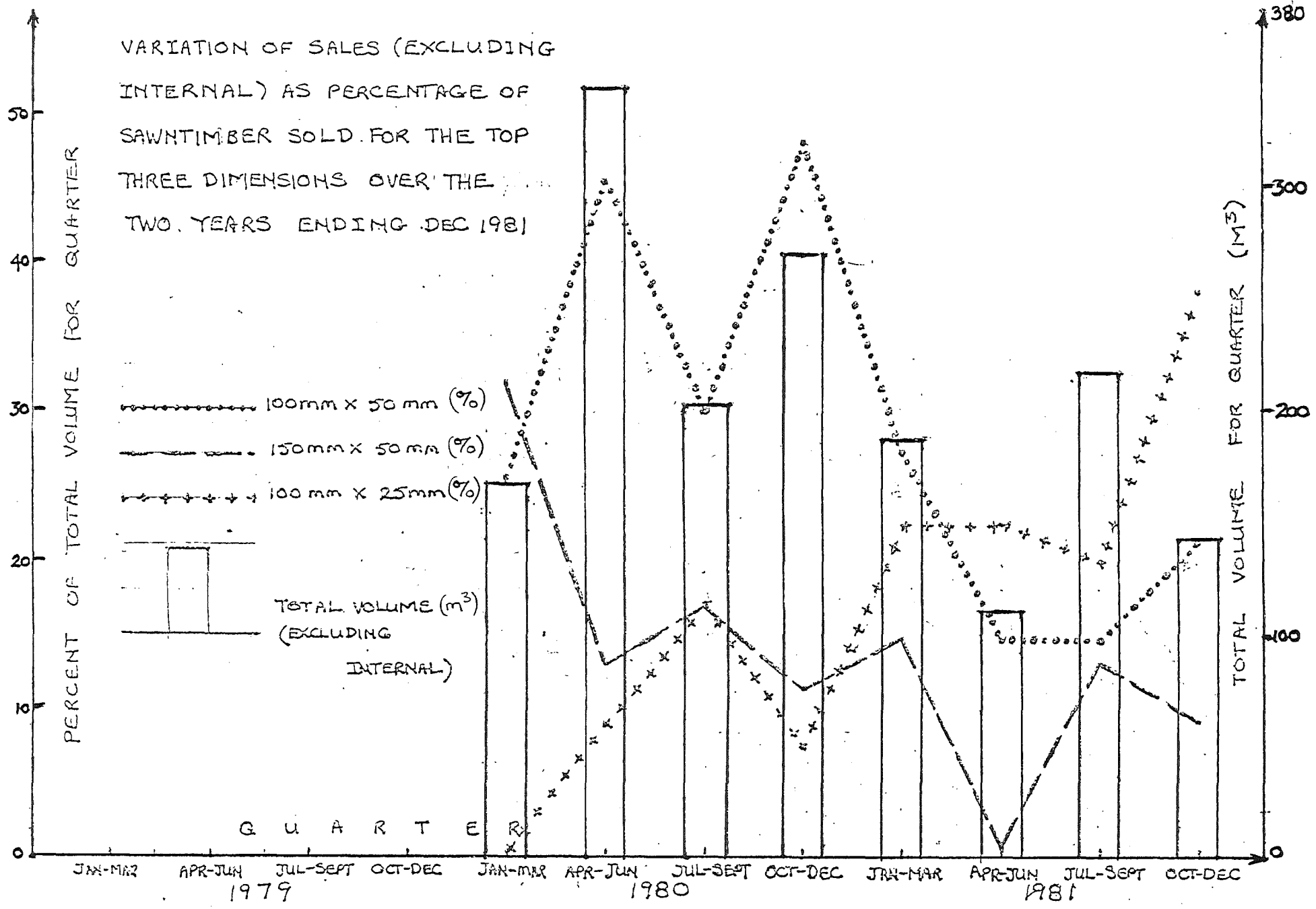

TABLE A.D.2.4.1.

SAWNTIMBER: DISTRIBUTION OF PIECES OVER LENGTH CLASSES FOR 1979,1980, 1981

OVERALL & DEC. 1981 STOCKTAKE AS PERCENT OF TOTAL (1)

LENGTH CLASS	YEAR						OVERALL		STOCKTAKE	
	1979		1980		1981					
	Pcs	%	Pcs	%	Pcs	%	Pcs	%	Pcs	%
0.9	976	7.336	0	0.0	150	0.185	1126	0.665	0	0.0
1.2	0	0.0	144	0.193	5245	6.453	5389	3.183	0	0.0
1.5	0	0.0	10	0.013	20	0.025	30	0.018	0	0.0
1.8	403	3.029	3257	4.359	2982	3.669	6642	3.923	4565	4.827
2.1	521	3.916	4632	6.199	5103	6.278	10256	6.058	6339	6.703
2.4	858	6.449	6381	8.540	7054	8.679	14293	8.442	11852	12.533
2.7	1165	8.756	7043	9.426	8222	10.116	16430	9.705	11404	12.059
3.0	1345	10.109	8777	11.747	9963	12.258	20085	11.863	14467	15.298
3.3	1533	11.522	9447	12.643	9595	11.805	20575	12.153	11012	11.644
3.6	1588	11.935	10558	14.130	8952	11.014	21098	12.462	7005	7.407
3.9	1010	7.591	11292	15.113	18072	22.235	30374	17.941	19231	20.335
4.2	973	7.313	4357	5.831	1912	2.352	7242	4.278	2810	2.971
4.5	880	6.614	2606	3.488	1281	1.576	4767	2.816	2074	2.193
4.8	515	3.871	1831	2.451	1025	1.261	3371	1.991	1753	1.854
5.1	493	3.705	1400	1.874	568	0.699	2461	1.454	832	0.880
5.4	452	3.397	979	1.310	554	0.682	1985	1.172	752	0.795
5.7	311	2.337	1355	1.813	145	0.178	1811	1.070	252	0.266
6.0	263	1.977	643	0.861	435	0.535	1341	0.792	212	0.224
6.3	19	0.143	7	0.009	0	0.0	26	0.015	5	0.005
6.6	0	0.0	0	0.0	0	0.0	0	0.0	2	0.002
6.9	0	0.0	0	0.0	0	0.0	0	0.0	2	0.002
(1) TOTAL	13305	100.000	74719	100.000	81278	100.000	169302	100.000	94569	100.000

TABLE A.D.2.4.2

SAWNTIMBER: MONTHLY PATTERN OF SALES: NUMBER OF PIECES BY LENGTH - CLASS AND MONTH-YEAR

MONTH	LENGTH - CLASS (mm)																					TOTAL
	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.3	6.6	6.9	
JANUARY '79				9	17	12	26	38	33	23	27	17	17	13	7	9	5	1				254
FEBRUARY	NO SALES																					
MARCH				15	22	32	32	71	53	123	31	35	24	20	3	7	3					471
APRIL				74	45	70	78	76	90	63	51	39	26	20	12	13	5	1	1			664
MAY				88	78	127	148	184	197	114	91	93	77	47	21	7	14	7	5			1298
JUNE	575			44	49	81	90	119	198	136	50	21	28	12	16	36	18	11	3			1487
JULY	400			21	20	28	78	46	90	72	80	74	80	48	15	10	6	9	0			1077
AUGUST	1			29	46	89	94	117	111	134	177	197	201	139	135	136	60	57	4			1727
SEPTEMBER				36	101	144	223	201	248	320	125	74	63	44	91	70	45	18	4			1807
OCTOBER				5	45	67	116	192	238	280	182	235	226	93	106	115	115	134				2149
NOVEMBER				24	35	125	142	165	154	178	103	100	95	46	46	35	30	23	1			1302
DECEMBER				58	63	83	138	136	121	145	93	88	43	33	41	14	10	2	1			1069
JANUARY '80				98	131	151	224	306	309	247	166	156	80	63	32	10	22	4				1999
FEBRUARY				24	34	62	95	90	152	170	107	125	135	52	51	40	53	42				1232
MARCH		4	10	237	343	419	435	490	617	680	480	403	344	198	220	161	407	216	1			5665
APRIL				149	244	401	393	595	830	792	571	393	256	166	169	193	225	132				5499
MAY				482	643	800	834	839	1351	968	937	751	449	376	351	237	321	109	4			9452
JUNE				423	619	707	755	933	1214	941	849	520	214	200	178	155	153	42				7903
JULY		140		385	489	637	584	635	776	675	499	471	218	171	139	91	120	23	2			6045
AUGUST				397	477	550	718	870	820	1252	508	294	175	120	10	14	3	6				6214
SEPTEMBER				203	361	479	602	715	667	1158	661	289	216	164	7	18	4	1				5545
OCTOBER				193	265	395	655	618	653	975	1902	166	132	103	17	8	5	2				6089
NOVEMBER				400	574	1016	1041	1321	1283	1752	2888	580	201	126	152	4	5					11346
DECEMBER				266	432	764	704	1375	775	948	1734	209	186	92	74	48	37	66				7730
JANUARY '81				69	298	171	283	433	445	323	895	37	50	16	8	12	1	18				3059
FEBRUARY				170	233	322	336	455	356	487	997	134	50	40	10	24	7	24				3645
MARCH			20	521	816	1257	1289	1666	1314	1454	2571	235	76	34	55	13	25	19				11368
APRIL				94	214	296	371	372	336	468	1080	44	26	12	7	4	11	24				3359
MAY				58	175	309	274	403	393	447	983	43	69	73	41	61	25	44				3398
JUNE				58	131	192	216	284	1583	522	614	13	42	26	8	1		3				3693
JULY				320	463	605	683	961	797	696	1981	143	76	88	35	22	2	24				6898
AUGUST	150			542	904	1632	2589	2905	2274	2096	4461	599	442	264	124	79	26	158				19245
SEPTEMBER				306	485	709	779	974	854	986	2528	291	148	135	102	57	18	72				8444
OCTOBER		5245		469	807	800	674	796	669	777	1076	219	137	111	121	74	16	30				12021
NOVEMBER				32	118	210	173	286	146	191	303	50	58	34	25	28	2	15				1671
DECEMBER				343	459	551	555	428	428	505	583	104	105	192	32	179	9	4				4477
TOTAL	1126	5389	30	6642	10256	14293	16430	20085	20575	21098	30374	7242	4769	3371	2461	1985	1811	1341	26	0	0	169302

TABLE A.D.2.5.1

SAWNTIMBER: DISTRIBUTION OF VOLUME OVER LENGTH CLASSES BY DIMENSION (1979, 1980 & 1981, AGGREGATED)

LENGTH CLASS (m)	D I M E N S I O N (mm)											TOTAL	
	100 x 50 (%)	150 x 50 (%)	100 x 25 (%)	75 x 50 (%)	50 x 25 (%)	75 x 25 (%)	150 x 25 (%)	100 x 75 (%)	150 x 75 (%)	200 x 50 (%)	Others (%)	(m^3)	%
0.9	0.0	0.0	0.001	0.0	9.432	0.0	0.0	0.0	0.0	0.0	0.232	1.596	0.073
1.2	0.0	0.0	0.0	0.0	67.648	0.0	0.0	0.0	0.0	0.0	0.286	9.203	0.420
1.5	0.0	0.0	0.0	0.0	0.271	0.0	0.0	0.0	0.0	0.0	0.012	0.055	0.003
1.8	1.129	0.581	3.985	1.480	0.348	3.592	3.016	0.646	0.246	0.295	1.560	34.392	1.570
2.1	2.574	1.514	6.635	3.080	5.403	5.524	5.139	1.312	0.368	0.859	2.584	64.822	2.958
2.4	5.510	2.367	8.853	5.688	2.089	8.315	6.722	3.999	0.795	1.621	24.659	107.143	4.890
2.7	6.893	4.260	10.554	7.193	2.116	9.680	7.811	4.905	2.526	3.039	7.457	139.457	6.365
3.0	11.147	7.497	11.884	9.633	2.640	11.955	11.669	10.206	6.491	5.648	10.359	202.736	9.253
3.3	12.045	11.982	11.970	11.152	2.298	13.026	11.709	9.164	9.970	7.901	12.674	234.183	10.688
3.6	16.230	14.224	12.774	17.043	1.358	14.171	15.406	14.788	16.841	8.988	10.002	288.619	13.172
3.9	17.507	21.800	20.361	22.961	3.697	19.365	18.038	18.909	18.473	9.098	22.932	390.538	17.824
4.2	6.473	8.994	4.268	5.482	0.975	5.087	4.911	6.950	10.806	8.165	5.793	128.034	5.843
4.5	4.580	7.461	2.689	4.218	0.392	2.651	4.412	5.415	6.842	9.577	5.616	97.750	4.461
4.8	4.088	5.035	1.818	2.960	0.975	2.305	3.009	5.721	7.391	6.483	3.873	75.977	3.468
5.1	2.623	4.090	1.644	2.600	0.148	1.499	2.562	3.246	4.473	9.080	3.416	58.496	2.670
5.4	3.137	3.605	0.943	2.009	0.209	1.053	2.821	3.937	6.000	7.293	2.827	55.812	2.547
5.7	2.763	3.570	0.661	2.625	0.0	1.062	1.809	4.551	4.666	14.580	3.498	57.049	2.604
6.0	1.927	2.952	0.995	1.850	0.0	0.714	0.916	6.179	3.742	7.244	2.088	42.810	1.954
6.3	0.042	0.068	0.005	0.026	0.0	0.0	0.051	0.073	0.368	0.129	0.132	1.136	0.052
TOTAL (m^3) (1)	585.126	346.039	306.279	182.426	12.922	130.803	93.324	64.816	57.716	48.867	161.486	1989.805	100.000
NO. LENGTHS (%) (2)	1.329	6.199	3.935	3.025	90.996	0.0	0.001	0.0	0.0	0.0	11.850	201.297	
TOTAL (m^3) (3)	593.011	368.906	316.826	188.116	143.519	130.803	93.325	64.816	57.716	48.867	183.195	2191.102	

(1) This total includes the volume of only those pieces for which the length was recorded.

(2) The Volume of those pieces for which no length was recorded. Percentage is of total (3).

(3) The total volume sold. (3) = (1) + (2).

TABLE A.D.2.5.2

SAWNTIMBER: DISTRIBUTION OF VOLUME OVER LENGTH CLASSES BY DIMENSION FOR 1979 AS PERCENT OF TOTAL (1)

LENGTH CLASS (m)	D I M E N S I O N S (mm)											TOTAL (1)	
	100 x 50	150 x 50	100 x 25	75 x 50	50 x 25	75 x 25	150 x 25	100 x 75	150 x 75	200 x 50	Others		
	Vol. (%)	Vol. (%)	Vol. (%)	Vol. (%)	Vol. (%)	Vol. (%)	Vol. (%)	Vol. (%)	Vol. (%)	Vol. (%)	Vol. (%)	Vol. (m^3)	Vol. (%)
0.9	0.0	0.0	0.032	0.0	100.00	0.0	0.0	0.0	0.0	0.0	0.0	1.221	0.483
1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.8	1.710	0.466	3.421	1.433	0.0	2.440	3.901	1.034	0.0	0.098	1.773	2.990	1.182
2.1	3.383	0.986	3.923	2.507	0.0	7.115	2.806	0.863	0.0	0.459	2.392	4.808	1.901
2.4	5.037	1.962	1.210	5.200	0.0	10.844	6.769	4.335	0.276	1.049	2.899	8.978	3.549
2.7	8.475	4.696	12.872	6.407	0.0	13.724	7.936	7.316	0.932	2.065	5.365	15.030	5.941
3.0	9.996	7.453	11.500	10.125	0.0	27.110	8.906	4.680	4.142	4.097	6.288	20.225	7.995
3.3	13.244	11.777	12.012	9.338	0.0	12.302	14.206	3.793	3.417	4.326	8.295	26.552	10.495
3.6	12.126	13.839	12.640	15.599	0.0	14.236	13.466	16.847	9.527	9.046	5.420	31.514	12.457
3.9	8.795	6.680	8.166	8.679	0.0	5.729	9.958	9.927	9.873	8.309	9.724	22.360	8.836
4.2	7.846	11.251	5.141	9.223	0.0	3.795	7.108	16.552	11.598	10.095	8.928	24.680	11.337
4.5	7.994	11.399	5.798	7.892	0.0	1.524	6.012	8.498	12.427	12.783	12.027	24.892	9.839
4.8	5.302	5.361	5.102	6.013	0.0	0.542	3.848	5.123	9.941	8.915	8.393	15.024	5.939
5.1	4.225	6.686	4.928	5.938	0.0	0.0	3.483	3.350	11.149	14.208	5.436	15.912	6.290
5.4	5.219	6.643	1.913	3.820	0.0	0.0	6.092	3.547	12.427	7.080	10.006	15.723	6.215
5.7	3.146	4.567	0.367	4.368	0.0	0.645	3.892	2.808	5.902	10.587	6.005	11.560	4.570
6.0	3.093	4.030	0.773	3.272	0.0	0.0	1.247	11.330	6.213	6.883	7.050	10.781	4.262
6.3	0.406	0.204	0.204	0.186	0.0	0.0	0.374	0.0	2.174	0.0	0.0	0.732	0.290
TOTAL (m^3) (1)	54.312	92.675	7.761	25.444	1.219	1.660	12.632	9.135	9.777	18.306	20.054	252.983 (3)	
NO LENGTH (%) (4)	12.674	18.046	49.253	0.0	96.269	0.0	0.0	0.0	100.000	0.0	30.874	0.0	
TOTAL (2)	62.203	113.082	15.284	25.444	32.667	1.660	12.632	9.135	9.777	18.306	29.010	329.212	

(1) Excluding all lengths for which no length was assigned.

(2) Total Volume sold, including pieces for which no length was assigned.

(3) Totals for Dimensions do not add exactly to this figure due to rounding errors.

(4) Percentage is of total (2).

TABLE A.D.3.1

POSTS & POLES: TOTAL SALES FOR 1979, 1980 AND 1981 AS NUMBER OF PIECES:

LENGTH CLASSES BY DIAMETER CLASSES

	7	10	13	16	19	22	25	28	TOTAL
1.4	579	64	731	773	1288	30	13	0	3478
2.0	77286	52850	10886	5852	1345	357	169	0	148745
2.4	8	248	1084	1108	115	26	24	0	2613
2.7	0	61	864	1386	420	78	10	0	2819
2.8	0	21	21	911	64	22	14	0	1053
3.0	1190	19561	14615	4703	959	111	12	0	41151
3.5	0	38	1694	4988	785	368	34	0	7907
4.0	194	301	123	792	509	54	0	0	1973
4.5	0	1	4	149	260	35	4	0	453
5.0	0	812	0	64	161	45	7	0	1089
5.5	0	0	1	31	160	67	14	1	274
6.0	0	0	3	89	182	64	29	8	375
6.5	0	0	0	17	30	16	2	0	65
7.0	0	0	0	24	43	31	9	1	108
7.5	0	0	44	7	43	29	15	8	146
8.0	0	0	51	25	40	37	27	3	183
8.5	0	0	0	6	1	39	10	4	60
9.0	0	234	0	10	42	31	35	2	354
9.5	0	0	0	19	88	35	9	0	151
10.0	0	0	0	13	27	6	2	0	48
TOTAL	79257	74191	30121	20967	6562	1481	439	27	213045

APPENDIX A.D.3.2

TABLE A.D.3.2

POSTS & POLES: TOTAL SALES FOR 1979 AS NUMBER OF PIECES:

LENGTH CLASSES BY DIAMETER CLASSES

	7	10	13	16	19	22	25	28	TOTAL
1.4	329 (2)	10	175	193 (2)	743		4 (2)		1454
2.0	1901	1690	2140	389	24	15	98		6257
2.4		238 (2)	177	222	22	6			665
2.7									
2.8		15	5	84	36	2			142
3.0	1044	2413	3814 (2)	825 (1) (2)	32	4			8132
3.5		10	576	372	132	91 (2)	4		1185
4.0	194	255		46 (2)	42	22			559
4.5				56	15	2			73
5.0		601		4	4	3			612
5.5			1	4	105	32	10	1	153
6.0				10	4	5	3		22
6.5				1	1	1			3
7.0				3					3
7.5			44 (2)			7	7	6	64
8.0			51	1 (2)	3	5	2		62
8.5									
9.0		234		2	2	12	2	1	253
9.5									
10.0									
TOTAL	3468	5466	6983	2212	1165	207	130	8	19639

(1) ½ Rounds Included

3.0 x 16 - Mar. - 15

(2) Odd Lengths Included

1.4 x 7	Includes	1.3 x 5 - 110
1.4 x 7	"	1 x 7 - 12
1.4 x 25	"	1.6 x 25 - 2
1.4 x 16	"	1 x 15 - 150
2.4 x 10	"	2.4 x 12 - 200
3 x 13	"	3 x 12 - 94
7.5 x 13	"	7.4 x 13 - 44
3 x 16	"	3 x 15 - 212
3.5 x 22	"	3.3 x 22 - 20
8 x 16	"	8 x 17 - 1

N.B. Not included in table -

489 pieces unknown sizes.

APPENDIX A.D.3.3

TABLE A.D.3.3

POSTS & POLES: TOTAL SALES FOR 1980 AS NUMBER OF PIECES:

LENGTH CLASSES BY DIAMETER CLASSES

	7	10	13	16	19	22	25	28	TOTAL
1.4	250(2)	0	125	495	389(2)	6	8	0	1273
2.0	50482(1)	36275(1)	5086	3723	1274	263	45	0	97148
2.4	8	10	458(1)	778(1)	39	20	4	0	1317
2.7	0	45	406	939	291	78	8	0	1767
2.8	0	0	4	110	18	20	14	0	166
3.0	6	6850	4820	1681	600	105	12	0	14074
3.5	0	20	619	1152	304	213	30	0	2338
4.0	0	0	12	548(2)	152	23(2)	0	0	735
4.5	0	0	2	36	100	33	3	0	174
5.0	0	210	0	5	29	20	1	0	265
5.5	0	0	0	15	21	11	1	0	48
6.0	0	0	0	20	64	30	6	4	124
6.5	0	0	0	14	24	13	1	0	52
7.0	0	0	0	20	31	17	7	1	76
7.5	0	0	0	6	33	16	4	0	59
8.0	0	0	0	11	23	7	6	1	48
8.5	0	0	0	4	1	2	4	3	14
9.0	0	0	0	4	25	6	0	0	35
9.5	0	0	0	0	1	0	0	0	1
10.0	0	0	0	1	0	0	0	0	1
TOTAL	50746	43410	11532	9562	3419	883	154	9	119715

(1) ½ Rounds Included:

2.0 x 7 - Mar. - 392
Apr. - 1252
May - 3738
July - 170
Sept.- 2214
Oct. - 2494
Nov. - 2781
Dec. - 1106

2.0 x 7 Total 14147

2.0 x 10 - Apr. 6
2.4 x 16 - June 2
2.4 x 13 - Apr. 16
2.4 x 13 - May 9

Total ½ Rounds = 14180

... ...

TABLE A.D.3.3(Contd)

(2) Odd Lengths Included

1.4 x 7	-	Includes	1.0 x 7	-	250
1.4 x 19	-	"	1.0 x 19	-	20
4 x 16	-	"	4.0 x 15	-	6
4 x 22	-	"	4.0 x 23	-	21

TABLE A.D.3.4

POSTS & POLES: TOTAL SALES FOR 1981 AS NUMBER OF PIECES

LENGTH CLASSES BY DIAMETER CLASSES

	7	10	13	16	19	22	25	28	TOTAL
1.4	0	54	431	85(2)	156	24	1	0	751
2.0	24903(1)	14885(1)(2)	3660(1)	1740(1)	47(1)	79	26	0	45340
2.4	0	0	449(2)	108	54	0	20	0	631
2.7	0	16	458	447(1)	129	0	2	0	1052
2.8	0	6	12	717	10	0	0	0	745
3.0	140	10298(2)	5981(1)(2)	2197(1)(2)	327	2	0	0	18945
3.5	0	8	499(2)	3464(1)(2)	349	64	0	0	4384
4.0	0	46	111	198	315(1)	9	0	0	679
4.5	0	1	2	57	145	0	1	0	206
5.0	0	1	0	55	128	22	6	0	212
5.5	0	0	0	12	34	24	3	0	73
6.0	0	0	3	59	114	29	20	4	229
6.5	0	0	0	2	5	2	1	0	10
7.0	0	0	0	1	12	14	2	0	29
7.5	0	0	0	1	10	6	4	2	23
8.0	0	0	0	13	14	25	19	2	73
8.5	0	0	0	2	0	37	6	1	46
9.0	0	0	0	4	15	13	33	1	66
9.5	0	0	0	19	87	35	9	0	150
10.0	0	0	0	12	27	6	2	0	47
TOTAL	25043	25315	11606	9193	1978	391	155	10	73691

(1) ½ and ¼ Rounds Included:

½R - 2 x 7 -	Mar.	1615 pcs
	Apr.	392 "
	June	260 "
	Aug.	200 "
	Sept.	2118 "
	Oct.	1323 "
	Dec.	336 "
¼R - 2 x 7 -	June	30 "
	July	119 "
	Aug.	441 "
	Sept.	152 "

... ...

TABLE A.D.3.4 Contd.

½R - 2 x 10 - Oct.	98	pcs
Nov.	155	"
¼R - 2 x 10 - Aug.	70	"
Dec.	194	"
½R - 2 x 13 - May	1	"
½R - 2 x 16 - Feb.	20	"
- May	160	"
½R - 2 x 19 - Nov.	4	"
½R - 2.7x16 - Nov.	5	"
½R - 3 x 13 - May	22	"
½R - 3 x 16 - Mar.	20	"
½R - 4 x 19 - Mar.	98	"
Total ½R =	6827	"
¼R =	1006	"
TOTAL =	7833	"

(2) Rejects

1.4 x 16 - Aug.	24	pcs
2 x 10 - Oct.	10	"
2.4 x 13 - Apr.	20	"
3 x 10 - Aug.	12	"
3 x 10 - Sept.	10	"
3 x 13 - Aug.	4	"
3 x 13 - Sept.	10	"
3 x 13 - Dec.	12	"
3 x 16 - Dec.	6	"
3.5 x 3 - Dec.	24	"
3.5 x 16 - Dec.	22	"

APPENDIX A.D.3.5

TABLE A.D.3.5

POSTS & POLES: DECEMBER 1981 STOCKTAKE[2]

NUMBER OF PIECES: LENGTH CLASSES BY DIAMETER CLASSES

	7	10	13	16	19	22	25	28	TOTAL
1.0	201	0	0	0	0	0	0	0	201
1.4	0	286	223	39	217	240	73	0	1078
2.0	10792[1]	11438[1]	4602	2931	2789	130	29	0	32711
2.4	0	20	258	51	877	73	0	0	1279
2.7	0	23	18	2046	1477	18	0	0	3582
2.8	1[1]	0	1	0	0	0	0	0	2
3.0	484	6081	3797	1516	557	88	3	0	12526
3.5	0	2	27	50	1530	260	63	2	1934
4.0	8	44	352	372	119	19	9	1	924
4.5	0	1	7	50	78	26	3	3	168
5.0	0	0	34	100	58	40	19	3	254
5.5	0	0	2	22	16	32	18	3	93
6.0	0	3	47	26	48	29	17	4	174
6.5	0	0	0	0	6	10	1	0	17
7.0	0	0	0	6	5	17	4	0	32
7.5	0	0	0	0	3	1	0	0	4
8.0	0	0	1	56	70	18	11	1	157
8.5	0	0	0	0	2	1	1	0	4
9.0	0	0	0	4	5	34	2	3	48
9.5	0	0	0	0	3	1	2	1	7
10.0	0	0	0	0	1	2	5	0	8
TOTAL	11468	17898	9369	7269	7861	1039	260	21	55203

(1) ½ and ¼ Rounds Included:

2 x 7 - ½R	-	354
2 x 7 - ¼R	-	1235
2 x 10- ½R	-	20
2.8 x 7 - ½R	-	1
Total:		1610

(2) This total does not include 853 cubic metres of Consignment/Agents stock, Rejected and Written Off stock.

TABLE A.D.3.6

POSTS & POLES: DISTRIBUTION OF SALES AND STOCK AS NUMBER OF PIECES OVER DIAMETER CLASSES

DIAMETER CLASSES (cm)	Y E A R						OVERALL NUMBER OF PIECES		STOCKTAKE NUMBER OF PIECES	
	1 9 7 9		1 9 8 0		1 9 8 1					
	Pcs	Pcs(%)	Pcs	Pcs(%)	Pcs	Pcs(%)	Pcs	Pcs(%)	Pcs	Pcs(%)
7	3468	17.659	50746	42.389	25043	33.984	79257	37.202	11468	20.774
10	5466	27.832	43410	36.261	25315	34.353	74191	34.824	17898	32.422
13	6983	35.557	11532	9.633	11606	15.750	30121	14.138	9369	16.972
16	2212	11.263	9562	7.987	9193	12.475	20967	9.842	7269	13.168
19	1165	5.932	3419	2.856	1978	2.684	6562	3.080	7861	14.240
22	207	1.054	883	0.738	391	0.531	1481	0.695	1039	1.882
25	130	0.662	154	0.129	155	0.210	439	0.206	260	0.471
28	8	0.041	9	0.008	10	0.014	27	0.013	21	0.038
TOTAL	19639	100.000	119715	100.000	73691	100.000	213045	100.000	55203	100.000

TABLE A.D.3.7

POSTS & POLES: DISTRIBUTION OF SALES AND STOCK AS NUMBER OF PIECES OVER LENGTH CLASSES

LENGTH CLASSES (m)	YEAR						OVERALL NUMBER OF PIECES		STOCKTAKE NUMBER OF PIECES	
	1979		1980		1981					
	Pcs	Pcs(%)	Pcs	Pcs(%)	Pcs	Pcs(%)	Pcs	Pcs(%)	Pcs	Pcs(%)
1.0	0	0.0	0	0.0	0	0.0	0	0.0	201	0.364
1.4	1454	7.404	1273	1.063	751	1.019	3478	1.633	1078	1.953
2.0	6257	31.860	97148	81.149	45340	61.527	148745	69.819	32711	59.256
2.4	665	3.386	1317	1.100	631	0.856	2613	1.227	1279	2.317
2.7	0	0.0	1767	1.476	1052	1.428	2819	1.323	3582	6.489
2.8	142	0.723	166	0.139	745	1.011	1053	0.494	2	0.004
3.0	8132	41.407	14074	11.756	18945	25.709	4151	19.316	12526	22.691
3.5	1185	6.034	2338	1.953	4384	5.949	7907	3.711	1934	3.503
4.0	559	2.846	735	0.614	679	0.921	1973	0.926	924	1.674
4.5	73	0.372	174	0.145	206	0.280	453	0.213	168	0.304
5.0	612	3.116	265	0.221	212	0.288	1089	0.511	254	0.460
5.5	153	0.779	48	0.040	73	0.099	274	0.129	93	0.168
6.0	22	0.112	124	0.104	229	0.311	375	0.176	174	0.315
6.5	3	0.015	52	0.043	10	0.014	65	0.031	17	0.031
7.0	3	0.015	76	0.063	29	0.039	108	0.051	32	0.058
7.5	64	0.326	59	0.049	23	0.031	146	0.069	4	0.007
8.0	62	0.316	48	0.040	73	0.099	183	0.086	157	0.284
8.5	0	0.0	14	0.012	46	0.062	60	0.028	4	0.007
9.0	253	1.288	35	0.029	66	0.090	354	0.166	48	0.087
9.5	0	0.0	1	0.001	150	0.204	151	0.071	7	0.013
10.0	0	0.0	1	0.001	47	0.064	48	0.023	8	0.014
TOTAL	19639	100.000	119715	100.000	73691	100.000	13045	100.000	55203	100.000

TABLE A.D.3.8

POSTS AND POLES: MONTHLY PATTERN OF SALES AS PERCENT OF THE MONTH TOTAL NUMBER OF PIECES FOR THE TOP TEN PRODUCT CATEGORIES (SIZES)

MONTH	PRODUCT CATEGORIES (E) x (c.s.)													
	2 x 7	2 x 10	3 x 10	3 x 13	2 x 13	2 x 16	3.5 x 16	3 x 16	3.5 x 13	2.7 x 16	OTHER SIZES	ALL PIECES TOTAL	$\frac{1}{2} + \frac{1}{4}$ ROUNDS (1)	ROUNDS (1)
	%	%	%	%	%	%	%	%	%	%	%		Pcs	%
JAN. 1979	10.325	5.347	12.476	0.92	13.99	4.06	2.40	1.414	1.721	0.0	47.45	1627	0	0.0
FEB.	0.0	4.068	6.624	1.58	25.46	0.0	4.72	31.496	1.706	0.0	24.15	762	0	0.0
MARCH	0.0	2.306	15.883	19.97	36.60	0.48	1.001	2.785	0.31	0.0	20.67	2298	15	0.653
APRIL	13.944	0.0	23.268	33.04	0.0	8.25	3.63	3.49	0.0	0.0	14.37	3550	0	0.0
MAY	7.97	7.43	0.8	47.12	2.09	0.0	9.60	8.70	1.31	0.0	23.99	4264	0	0.0
JUNE	19.86	8.41	12.17	0.0	29.31	0.22	0.28	0.17	7.30	0.0	22.79	1808	0	0.0
JULY	9.46	13.06	20.43	2.33	10.48	0.12	1.64	0.0	13.80	0.0	28.69	2443	0	0.0
AUGUST	5.42	12.31	11.55	0.0	0.22	0.65	3.47	0.0	0.0	0.0	56.38	1844	0	0.0
SEPT.	63.69	0.0	0.0	0.0	0.0	0.0	1.91	0.0	0.0	0.0	34.39	314	0	0.0
OCT.	42.11	21.05	0.0	0.0	0.0	0.0	26.32	0.0	0.0	0.0	10.53	19	0	0.0
NOV.	0.0	0.0	0.0	75.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	12	0	0.0
DEC.	0.0	71.63	0.0	1.46	0.0	0.0	0.0	0.0	0.0	0.0	16.91	698	0	0.0
1979 TOTAL (Pcs)	1901	1690	2412	3814	2140	389	372	825	576	0.0	5520	19639	15	-
1979 TOTAL (%)	9.68	8.61	12.28	19.42	10.9	1.98	1.89	4.2	2.93	0.0	28.11	100.00	-	0.076
JAN. 1980	50.07	29.53	0.45	1.33	2.45	0.60	1.86	0.34	0.64	0.0	12.77	6705	0	0.0
FEB.	37.28	18.42	1.34	8.21	4.38	0.10	4.53	2.99	2.64	0.0	20.11	2009	0	0.0
MARCH	21.91	32.45	0.75	0.17	7.53	1.60	0.37	0.08	0.37	0.0	34.76	4810	392	8.15
APRIL	51.05	26.48	0.98	1.01	6.09	1.75	0.83	2.66	0.31	0.0	8.84	4468	1274	28.51
MAY	35.16	11.83	21.61	3.94	19.02	3.06	0.46	0.29	0.40	0.39	3.84	14022	374	26.72
JUNE	20.48	37.48	7.02	12.95	0.0	0.0	1.64	9.55	0.64	0.0	10.25	4400	2	0.05
JULY	29.48	54.05	4.27	3.49	0.98	1.73	0.42	0.42	0.13	0.81	4.23	18547	170	0.92
AUGUST	23.65	43.07	18.66	3.09	5.47	0.62	0.74	0.95	0.30	0.12	3.34	10142	0	0.0
SEPT.	39.61	48.40	1.67	3.82	0.70	0.0	0.87	2.00	0.57	0.0	2.36	14492	2214	15.28
OCT.	66.62	14.33	1.11	1.91	0.92	2.78	2.69	1.69	0.33	5.06	2.56	12232	2494	20.39
NOV.	59.48	11.95	1.43	7.73	1.64	9.60	0.0	0.53	0.91	0.56	6.17	14495	278	19.19
DEC.	43.56	22.27	0.78	3.15	2.58	7.33	1.02	1.99	0.73	0.17	16.42	13393	1106	8.26
1980 TOTAL (Pcs)	49482	36275	6850	4720	5086	3723	1152	1681	619	939	9188	119715	14180	-
1980 TOTAL (%)	41.33	30.30	5.72	3.94	4.25	3.11	0.96	1.40	0.52	0.78	7.67	100.00	-	11.84
JAN. 1981	25.33	2.23	0.08	30.17	3.69	0.13	1.58	9.59	2.42	2.40	22.38	4746	0	0.0
FEB.	36.32	12.08	6.46	4.39	9.92	2.86	7.34	6.04	0.98	3.72	9.90	4304	20	0.46
MARCH	38.34	26.02	3.07	6.00	5.29	5.04	2.91	3.37	1.85	0.0	8.10	6148	1733	28.19
APRIL	11.93	2.48	61.83	15.01	0.0	0.0	1.08	0.77	0.97	0.60	5.33	3511	329	9.37
MAY	3.46	42.28	30.66	1.61	7.94	3.26	1.57	0.93	0.75	0.0	7.55	5036	183	3.63
JUNE	16.32	12.19	20.07	8.34	1.57	0.57	29.36	4.66	0.29	0.0	6.64	7336	290	3.95
JULY	13.62	23.08	27.37	13.72	3.53	4.99	2.49	2.77	0.97	0.0	7.45	2886	119	4.12
AUGUST	42.52	37.39	3.01	5.65	2.98	1.88	0.39	0.87	0.02	0.0	5.29	8666	711	8.20
SEPT.	48.91	17.95	13.78	5.73	5.38	2.38	1.35	1.78	0.19	0.61	1.94	11618	2270	19.54
OCT.	46.25	24.54	6.32	1.90	5.66	2.94	2.23	3.00	0.17	0.0	6.95	7267	1421	19.55
NOV.	50.15	13.01	18.14	3.58	2.29	0.86	1.31	3.04	0.34	0.29	7.17	7849	164	2.09
DEC.	21.60	17.35	2.43	18.50	14.85	5.67	2.20	0.93	1.02	1.34	14.13	4324	530	12.26
1981 TOTAL (Pcs)	24903	14885	16298	5981	3660	1740	3464	2197	499	447	5617	73691	7770	-
1981 TOTAL (%)	33.79	20.20	13.97	8.12	4.97	2.36	4.70	2.98	0.68	0.61	7.62	100.00	-	10.54
1979,80,81 TOTAL (Pcs)	76286	52850	19560	14515	10886	5852	4988	4703	1694	1386	20325	213045	21950	-
1979,80,81 TOTAL (%)	35.81	24.81	9.18	6.81	5.11	2.75	2.34	2.21	0.80	0.65	9.54	100.00	-	10.30

(1) $\frac{1}{4}$ and $\frac{1}{2}$ Rounds are included under the headings to the left of the Total column. It is not a mutually exclusive category.

FIJI PINE COMMISSION - SAWMILLING & PROCESSING

METRIC POST & POLE VOLUME TABLE - TAPER - 9.18mm/m

SIZE:	6-8	9-11	12-14	15-17	18-20	21-23	24-26	27-29
LENGTH	7	10	13	16	19	22	25	28
1.0	.0044	.0086	.0142	.0213	.0297	.0396	.0509	.0636
1.2	.0054	.0105	.0173	.0258	.0360	.0479	.0615	.0768
1.4	.0064	.0125	.0205	.0305	.0424	.0564	.0723	.0902
1.6	.0075	.0145	.0237	.0352	.0434	.0649	.0332	.1038
1.8	.0087	.0166	.0270	.0400	.0556	.0737	.0943	.1175
2.0	.0098	.0187	.0304	.0450	.0623	.0825	.1055	.1314
2.2	.0111	.0209	.0339	.0500	.0692	.0915	.1169	.1454
2.4	.0124	.0232	.0375	.0551	.0762	.1006	.1284	.1596
2.6	.0137	.0256	.0411	.0604	.0833	.1098	.1401	.1740
2.7	.0144	.0268	.0430	.0630	.0867	.1145	.1460	.1813
2.8	.0151	.0280	.0449	.0657	.0903	.1192	.1519	.1886
3.0	.0165	.0305	.0487	.0711	.0973	.1288	.1639	.3033
3.5	.0204	.0370	.0586	.0852	.1167	.1532	.1946	.2410
4.0	.0245	.0440	.0691	.0999	.1364	.1785	.2262	.2797
4.5	.0290	.0515	.0802	.1153	.1563	.2047	.2589	.3195
5.0	.0339	.0594	.0919	.1314	.1781	.2318	.2926	.3604
5.5	.0392	.0678	.1041	.1482	.2001	.2598	.3273	.4025
6.0	.0448	.0767	.1170	.1657	.2230	.2888	.3630	.4451
6.5	.0509	.0861	.1304	.1840	.2467	.3186	.3998	.4901
7.0	.0573	.0960	.1445	.2029	.2713	.3405	.4376	.5356
7.5	.0642	.1064	.1593	.2227	.2967	.3813	.4765	.5824
8.0	.0716	.1174	.1746	.2432	.3236	.4141	.5165	.6303
8.5	.0793	.1290	.1907	.2644	.3501	.4479	.5576	.6794
9.0	.0876	.1411	.2074	.2865	.3782	.4827	.5999	.7298
9.5	.0963	.1539	.2249	.3073	.4072	.5185	.6432	.7813
10.0	.1055	.1672	.2430	.3330	.4371	.5553	.6877	.8342
10.5	.1152	.1811	.2619	.3575	.4679	.5932	.7333	.8883
11.0	.1254	.1957	.2814	.3828	.4997	.6321	.7801	.9436
11.5	.1362	.2108	.3018	.4089	.5324	.6731	.8280	1.0003
12.0	.1475	.2267	.3228	.4360	.5661	.7132	.8772	1.0582
12.5	.1593	.2431	.3447	.4639	.6008	.7553	.9275	1.1174
13.0	.1717	.2603	.3673	.4927	.6365	.7986	.9791	1.1780